UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF SOUTH CAROLINA
CHARLESTON DIVISION

IN RE: AQUEOUS FILM-FORMING FOAMS PRODUCTS LIABILITY LITIGATION	MDL No. 2:18-mn-2873-RMG This Document relates to: ALL CASES

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTION FOR PARTIAL SUMMARY JUDGMENT ON THE SECOND AND THIRD PRONGS OF THE GOVERNMENT CONTRACTOR IMMUNITY DEFENSE

Plaintiffs, through Co-Lead Counsel for the Plaintiffs' Executive Committee ("PEC"), respectfully submit this Omnibus Opposition to Defendants' Omnibus Motion for Partial Summary Judgment on the Second and Third Elements of the Government Contractor Immunity Defense; Defendant 3M Company's Motion for Partial Summary Judgment on the Second and Third Elements of the Government Contractor Immunity Defense; and the Telomer MilSpec AFFF Manufacturers'[1] (hereinafter referred to as "Telomer Defendants") Motion for Partial Summary Judgment on the Second and Third Elements of the Government Contractor Immunity Defense and its accompanying memorandum [ECF Nos. 2346-1, 2347 & 2348] ["Defendants' Omnibus Mem.," "3M Mot.," and "Telomer Defendants' Mem.," collectively "Defs.' Mot."].

In Defendants' Omnibus Mem., there is a section entitled "Common Undisputed Facts."[2] Despite this misleading title, these facts are disputed and thus Plaintiffs object to this characterization of these "facts," and, in response, refers the Court to Plaintiffs' Statement of Material Facts in Dispute, which is attached hereto as Appendix A.

[1] The "Telomer MilSpec AFFF Manufacturers" are Tyco Fire Products LP (formerly The Ansul Company), Chemguard, Inc., the Kidde Defendants, National Foam, Inc., and Buckeye Fire Equipment Company.

[2] *See* Defs.' Omnibus Mem. at 8-10.

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I. INTRODUCTION

Defendant 3M and certain of the telomer aqueous film-forming foam ("AFFF") Defendants ("Defendants") have moved for partial summary judgment on an affirmative defense arguing that they are entitled to government contractor immunity under *Boyle v. United Technologies Corp.*, 487 U.S. 500 (1998) [ECF Nos. 2346, 2347 & 2348].[3] As the parties with the ultimate burden of proof,[4] these Defendants have failed to demonstrate that no genuine issues of fact exist as to each prong of *Boyle, i.e.*: (1) that MIL-F-24385 has reasonably precise specifications, including that the government continued to use C8-containing AFFFs with full knowledge of all the harms associated with these products;[5] (2) that their AFFFs conformed at all relevant times to the allegedly precise specifications; and (3) that they warned the United States with all material information about the dangers of AFFF known to them that was unknown to the government. Their motions (including their original motion for summary judgment)[6] should be denied.

As a threshold matter, this case is profoundly different and clearly distinguishable from every other case cited by Defendants in which the government contractor defense was deemed applicable. The most notable distinction is that, here, Defendants, have, at all times, and more importantly, at the time of the underlying events themselves, denied the very existence of any defect as it relates to C8-containing AFFF. Conversely, in every case cited by Defendants –

[3] These motions pertain specifically to *Boyle* prongs two and three.

[4] Under *Boyle*, the Defendants have the burden of "[satisfying] the requirements of the military contractor defense." *Id.* at 514 (citation omitted).

[5] As the Court is aware, the Parties previously briefed *Boyle* prong one. Plaintiffs incorporate by reference the relevant parts of their arguments contained in their prior briefing regarding *Boyle* prong one, Pls.' Opp. To Defs.' Mot. For Partial Summ. J. on the First Element of the Government Contractor Immunity Defense [ECF No. 2063] ("Plaintiffs' Original Opp.").

[6] *See* Defendants' Omnibus Memorandum of Law in Support of their Motion for Partial Summary Judgment on the First Element of the Government Contractor Immunity Defense ("DCC's Original Mem.") [ECF No. 1965-1].

whether the defect at issue be a frayed parachute,[7] a defective rotor,[8] a missing rearview mirror,[9] or the presence of trace levels of dioxin in Agent Orange[10] – the defendants in each of those cases acknowledged at the time the product was being used by the government that the product at issue either had a defect and/or had the potential to cause harm, and, in some cases,[11] even discussed with the government proposed solutions to the defects.[12] In short, in those cases, no question of fact existed as to the *presence* of the alleged defect. In the absence of such factual disputes over the existence of a product defect, those courts were able to reach conclusions as a matter of law regarding the applicability of the government contractor defense.

In direct contrast, here, Defendants have at all relevant times, and continuing to this day, denied that C8-containing AFFFs are defective[13] or have the potential to cause harm to people,[14]

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[7] *Lewis v. Babcock Indus., Inc.,* 985 F.2d 83 (2d Cir. 1993).

[8] *Dowd v. Textron, Inc.*, 792 F.2d 409 (4th Cir. 1986).

[9] *Gauthreaux v. United States,* 694 F. Supp. 2d 460 (E.D. Va. 2009).

[10] *Agent Orange Prod. Liab. Litig.,* 304 F. Supp. 2d 404 (E.D.N.Y. 2004).

[11] *See, e.g.*, *Dowd*, 792 F.2d at 412 (Army "discussed the problem at some length with [contractor]"); *Yeroshefsky v. Unisys Corp.*, 962 F. Supp. 710, 721 (D. Md. 1997) (Government "rejected a number of [contractor's] proposals to improve the [product's] design").

[12] In anticipation of this point, the DCC made the specious distinction in their brief related to *Boyle* prong one, that in each of these government contractor cases the defendants "denied" the existence of a defect with respect to the product at issue. *See* DCC's Original Mem., at 48-49. Such characterization of those cases is disingenuous because such denials occurred only in the context of litigation. However, the undisputed facts in those cases, which weighed heavily in favor of finding government contractor immunity, are that the government contractor did not dispute the fundamental claim that there was, in fact, a defect in the product at issue at the time of the events themselves, in stark contrast to the facts here.

[13] As the Court is aware, Plaintiffs here allege that C8-containing AFFFs are defective. As it pertains to 3M, this "long-chain" defect involves the intentional addition of PFOA and PFOS into 3M's MilSpec AFFF. With respect to the Telomer Defendants, Plaintiffs allege that these Defendants' telomer-based AFFFs are defective insofar as the Telomer Defendants intentionally added fluorosurfactants containing C8 molecules into their AFFFs that can degrade to PFOA in the environment (i.e., C8s that are PFOA precursors). A precursor chemical is a chemical capable of transforming into another compound through chemical reactions.

[14] The Defendants have always collectively maintained that PFOA and PFOS at the levels found in the environment and human blood, both today and historically, do not and have never posed a risk of harm to human health. *See, e.g.*, Plaintiffs' Exhibit ("Pl. Ex.," referring to the exhibits to Plaintiffs' Original Opp.) 47, Reich Dep Ex. DL49, 3M phaseout announcement, at 3M_AFFF_MDL00207575 (3M stating that "[a]ll existing scientific knowledge indicates that the presence of these materials at these very low levels does not pose a human health or environmental risk."); *see also* Tyco's website (claiming that Regulatory agencies have not found a cause-and-effect relationship between

a falsehood they have repeated throughout the decades, and which has had direct consequences on the government's understanding of the potential risks associated with the use of AFFF. Perhaps unwittingly, through this decades long campaign of denial, Defendants have created their own question of fact: how can it be that the government had actual knowledge of the defects of C8-containing AFFFs, and knew that use of C8-containing AFFF posed a risk of harm to human life, yet continued to use it anyway, when the Defendants deny such a risk of harm ever existed?

In addition to being fundamentally distinguishable from the cases cited by Defendants wherein the government contractor defense was implicated, Defendants have likewise failed to establish either that their AFFFs were consistently in conformance with MIL-F-24385's specifications (*Boyle* prong two) and/or that they were fully transparent with the government with respect to their knowledge of the dangers posed by C8-containing AFFFs (*Boyle* prong three). As the Court recognized during the March 25, 2022 telephonic hearing, *Boyle* prongs one and three are intertwined.[15] More specifically, what the government knew or did not know about the harms to humans associated with the use of C8-containing AFFF is, in part, informed, or more aptly misinformed, by what industry told them, which resultantly leads to the overlap of *Boyle* prongs one and three. As set forth below, the evidence in this case demonstrates that the government's actual knowledge[16] of the potential harms to humans associated with C8-containing AFFFs was heavily influenced by industry misrepresentations, outright denials, and delays in the disclosure of significant risk information, and, at all relevant times, was far inferior to Defendants' knowledge.

PFAS and human disease, and the effects observed have not been consistent), available at: https://tycomarinette.com/the-science-of-pfas-and-firefighting-foam/ (last visited June 17, 2022.)

[15] *See* Mar. 25, 2022 Telephonic Hr'g Tr. [ECF No. 2261], at 3:7-13 (stating that there is overlap between *Boyle* prongs one and three).

[16] As is discussed more fully herein, under *Intel Corp. Invest. Policy Comm. v. Sulmya*, 140 S. Ct. 768 (2020), "actual knowledge" means the actor must "in fact have become aware of that information." *Id*. at 777.

More particularly, when the evidence is viewed in its totality, it is abundantly clear that the government was not merely misled by industry, but, in fact, was outright lied to deceived into believing that the continued use of C8-containing AFFFs was safe and posed no threat to the environment and/or the American public. This industry deception becomes even more patent when juxtaposed with Defendants' actual knowledge of the harms to humans associated with C8-containing AFFFs over time. Notably, none of the cases cited by the Defendants are characterized by this level of industry malfeasance. The AFFF story reads like that of the tobacco industry's decades of denial, manipulation, and deceit regarding cigarettes, addiction, and lung cancer; here, in the case of AFFF, such conduct resulted in the widespread contamination of virtually an entire planet with the harmful forever chemicals, PFOA and PFOS.[17]

In fact, in 2005 and 2006, and, as is more fully discussed below, DuPont and 3M, respectively, were each fined substantial penalties for failing to disclose "significant risk information" regarding both PFOA and PFOS. In 2006, the then EPA Administrator, Stephen Johnson, noted in regard to PFOA that there are "many … critical information gaps that exist around our understanding of potential exposures and risks."[18] These fines, specifically levied for the withholding of "significant risk information" are virtually *res ipsa* evidence of industry withholding critical information regarding the dangers of PFOA and PFOS, thereby depriving government of its ability to fully and completely know, understand or appreciate the potential risk of harm from use of AFFF, while at the same time illustrating in black and white the disparity in

[17] *See* Butenhoff Dep. Exs. LP3 & LP34, attached to London Decl. as Exs. 128 & 129, respectively (identifying the multiple environmental media in which PFOA and PFOS can be found).

[18] *See* EPA Press Release, dated Apr. 25, 2006, attached to London Decl. as Ex. 130, available at: https://www.epa.gov/enforcement/3m-company-settlement (last visited June 17, 2022); *see* EPA Press Release, dated Dec. 14, 2005, attached to London Decl. as Ex. 131, available at: https://www.epa.gov/enforcement/reference-news-release-epa-settles-pfoa-case-against-dupont-largest-environmental (last visited June 17, 2022); *see also* Def. Ex. 106, at FF_NAVY11_00432968.

the level of knowledge between industry and government.[19] This is only one of *many* demonstrable instances of similar industry misdeeds described in greater detail below, which make clear that the Defendants cannot meet their burden under *Boyle* or demonstrate their entitlement, as a matter of law, to the extraordinary relief they request; immunity from liability.

II. FACTUAL BACKGROUND

A. 3M's Efforts to Conceal the Dangers of its Products Does Not Justify Immunity

Rather than admit or acknowledge that it was aware of harms to humans associated with its AFFFs, 3M spent decades denying that harms existed and delaying disclosure of significant risk information, and proactively engaged in conduct intended to deceive the scientific community and the public at large. For example, [redacted],"[20] and the Fluoro-Chemical "crisis management"[21] team in an obvious attempt to limit reputational damage stemming from C8-chemistry and to influence the scientific community.

[redacted].[22]

[19] As the Court recalls, during the telephonic conference of April 6, 2022, the Court noted in response to Plaintiffs' concern that DuPont and Dynax would not be parties to this motion: "I know you want to get in information that you believe is misinformation provided by these two defendants. To the extent that it in combination of other information was misleading the Government, I think you can mention that without having me address the issue of their availability for government contractor immunity." *See* Apr. 6, 2022, Hr'g Tr, at 26: 2-8.

[20] *See* Bacon Dep. Ex. DL144, attached to London Decl. as Ex. 132, at 3M_BELL03195195.

[21] *See* Pl. Ex. 16, Santoro Dep. Ex. DL187, at 3M_AFFF_MDL01092219.

[22] *See* Weppner Dep. Ex. BB76, attached to London Decl. as Ex. 133, at 3M_BELL02614819-823.

[redacted].[23] [redacted]

[redacted]).[24] [redacted]

[redacted]"[25]

[redacted]." [26] This effort resulted in 3M successfully infiltrating major scientific journals with editors who were on their payroll for the purpose of, for example, keeping "bad papers out of the literature," [27,28] to "hide the winnie [sic]," [29] and paid those persons in a way "so there was no paper trail to 3M . . . ." [30] In so doing, 3M concealed substantial evidence of harm caused by its products to humans and the environment, thereby misleading the government and the public.

The evidence reflects that this conduct, in connection with significant misrepresentations, had a profound effect on the government's understanding of the potential harms caused by AFFF.

[23] *See* 3M_BELL02615371, attached to London Decl. as Ex. 134, at 3M_BELL02615392-5396.

[24] *See, e.g.,* Bacon Dep. Ex. DL144, Ex. 132, at 3M_BELL03195233.

[25] *See* 3M_BELL02615371, Ex. 134, at 3M_BELL02615396.

[26] *See, e.g.*, Bacon Dep. Ex. DL144, Ex 132, at 3M_BELL03195225-231.

[27] *See* Bacon Dep. Ex. BB122, attached to London Decl. as Ex. 135, at 3M_MN05334325.

[28] *See* 3M_MN05334328, attached to London Decl. as Ex. 136, at 3M_MN05334329.

[29] *See* Bacon Dep. Ex. DL293, attached to London Decl. as Ex. 137, at 3M_BELL00039088.

[30] *See* Bacon Dep. Ex. DL296, attached to London Decl. as Ex. 138, at 3M_BELL00039446.

For example, despite publicly claiming that its AFFF was "safe to use;"[31] "relatively innocuous;"[32] and "practically nontoxic;"[33] 3M internally described PFOS[34] as "*insidiously toxic*"[35] – a classification which was never shared with anyone outside of 3M. In fact, as far back as 1979, 3M internally considered PFOS to be more toxic than even PFOA.[36] This discrepancy (*i.e.*, between 3M's internal knowledge of PFOS toxicity and its misrepresentations to AFFF users (including the United States), that its AFFF was safe), creates an issue of fact in and of itself that requires a determination as to whether the Department of Defense ("DoD") continued to use C8-containing AFFFs with actual knowledge of all potential for harms associated with its products given the information or lack of information it was provided by industry, including 3M. It likewise creates a clear issue of fact with respect to whether 3M was fully transparent with the government with respect to the dangers it knew that were posed by C8-containing AFFFs, which, the evidence confirms, it was not.

Perhaps the most critical piece of evidence in this regard, which is discussed in greater detail below,[37] is 3M's failure to disclose to the Environmental Protection Agency ("EPA") that PFOS had been found in the blood of the general population as early as 1975. Despite this

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[31] *See* Schuster Dep. Ex. LP841, attached to London Decl. as Ex. 139, at 3M_GU00267402 (3M stating that, "3M Class B foam agents currently in the field are safe to use and, under proper storage conditions, will remain effective for years.") *See also* 3M's current website stating that, "[t]he weight of scientific evidence from decades of research does not show that PFOS or PFOA causes harm in people at current or past levels"), available at: https://www.3m.com/3M/en_US/pfas-stewardship-us/health-science/ (last visited on June 17, 2022).

[32] *See* Pl. Ex. 98, Darwin Dep. Ex. DL53, at Navy02-00007167.

[33] *See* Pl. Ex. 102, Walker Dep. Ex. BB816, at 3M_BELL01440788.

[34] PFOS is the C8 fluorosurfactant in 3M's LightWater® AFFF, which is a unique compound made almost exclusively by 3M. *See, e.g.*, Pl. Ex. 9, Walker Dep. Ex. DL156, at 3M_BELL01511645-46

[35] *See* Butenhoff Dep. Ex. DL1, attached to London Decl., as Ex. 140, at 3M_BELL00827716.

[36] *See* Butenhoff Dep. Ex. DL15, attached to London Decl. as Ex. 141, at 3M_BELL00039929 (a 3M internal review of various animals exposed to both FC-143, also known as PFOA, and FC-95, also known as PFOS, concluding that PFOS was the more toxic of the two and "certainly more toxic than anticipated.")

[37] *See* § IV.B, *infra*. *See also* Pls.' Original Opp. at 11-15.

knowledge of widespread PFOS exposure in the general population as of 1975, 3M failed to inform EPA until 1998.[38] Moreover, the record demonstrates that 3M's lawyers urged 3M scientists to withhold from the public and the government that PFOS had been found in the blood of the general population..[39] Clearly, this important and material piece of information is of the type that would have impacted regulatory decision-making had it been revealed to governmental authorities sooner.[40] Even after 3M disclosed this crucial fact to the EPA, 3M continued to reassure the government and the public that there was no danger to human health at the levels at which this chemical was found both in the environment and the blood of the general population.[41]

More particularly with respect to AFFF, following 3M's May 16, 2000, announcement of their intention to phase out perfluorooctanyl chemistries,[42] 3M sent a letter to end users of their AFFFs, which includes DoD, reassuring them that despite the phaseout, "use of these products does **not** pose a risk to people," that AFFF products "are safe to use" and "will remain effective for years," and further stating that "there's no reason to return any of these products you may have in your inventory."[43] 3M has never once wavered from these claims in over 20 years; again begging the question, how could it be argued that the government used AFFF allegedly knowing of the potential harms resulting from AFFF use when the Defendants themselves have denied there is

[38] *See* Pl. Ex. 50, Gerber Dep. Ex. DL353, at 3M_BELL02796621 (3M's 1998 8(e) filing wherein it finally informed EPA that PFOS had been found in the blood of the general population).

[39] *See* Pl. Ex. 20, Gerber Dep. Ex. LP68, at 3M_BELL00054594 (stating that "3M lawyers urge [Central Analytical Laboratory] not to release the true identity (PFOS) of the [fluorine]compound.")

[40] In fact, the record establishes that it was the reporting of PFOS in blood of the general population that prompted the EPA to investigate PFOS. *See* Pl. Ex. 51, Letter from Charles Auer, EPA's Office of Pollution Prevention and Toxics ("OPPT"), to Scott A. Masten, Ph.D., NIEHS, dated Aug. 7, 2003, at 3M_AFFF_MDL01669634 (stating that, "OPPT has been assessing perfluorinated compounds since 1999. ***This interest was prompted by reports submitted to the agency describing the toxic properties and widespread presence in the environment***, including human populations, of…[PFOS]") (emphasis added).

[41] *See* Pl. Ex. 47, Reich Dep. Ex. DL49, at 3M_AFFF_MDL00207575-576.

[42] *See id*.

[43] *See* Schuster Dep. Ex. LP841, Ex. 139, at 3M_GUU0267402.

any such risk of harm in the first place, and literally *encouraged* its continued use? As previously stated, at the very least, Defendants have created their own question of fact.

Remarkably, 3M repeatedly and erroneously claims that EPA was made aware of the presence of PFOS in the blood of the general population, long before 1998, on the basis of a single article published in 1976 by Drs. Guy and Taves.[44] Drs. Guy and Taves were looking into the presence of fluorine in the environment, and its potential implications for dental health. During the course of their investigation, Drs. Guy and Taves stumbled on a discovery of what they understood to be an unknown man-made carbon fluorine compound, an "organic fluorine." It is this paper that the defense claims informed EPA of the presence of PFOS in the blood of the general population. Yet, notably, nowhere in their 1976 paper can the word PFOS be found. In fact, in their paper, Drs. Guy and Taves suggest perhaps the organic compound they discovered is *PFOA*, "or something similar," making an obscure reference to the compound potentially being a "sulphonic acid." Simply put, these two investigators did not know what they found and there is zero evidence indicating they believed it to be PFOS. Now, almost 50 years later, 3M wants this Court to believe that, on the basis of a strained reading of one article published in 1976, that the EPA, at perhaps its highest levels knew, and understood, that PFOS was in the blood of the general population as of 1976—something these two researchers themselves were unable to determine, partly, as is explained in greater detail below, because of 3M's own actions.

Moreover, the fact that in 1998 3M felt it needed to report to EPA the presence of PFOS in the blood of the general population and did so by way of a formal TSCA 8(e) submission (which, by definition, means reporting previously unknown information),[45] in and of itself confirms that

[44] *See* 3M's Mot. at 15-16.

[45] Section 8(e) of the Toxic Substances Control Act (TSCA) serves as an "early warning" mechanism for keeping the EPA and others apprised of new-found serious chemical hazards. It states that "any person who manufactures

3M itself did not believe EPA to be aware that PFOS had been found in the blood of the general population prior to 1998. In fact, following its 1998 8(e) submission to EPA, 3M claimed in statements to the press that the finding was a "total surprise."[46]

These two positions are patently irreconcilable. That is, on the one hand that 3M would have this Court believe that somehow the EPA, from a single article published in 1976 that makes no reference whatsoever to PFOS, somehow knew of the presence of PFOS in the blood of the general population, yet, on the other hand, reported this information in 1998 as new information under TSCA 8(e) and claimed the discovery a surprise. Certainly, the foregoing begs the factual question, if 3M's claim is accurate, and Drs. Guy and Taves' 1976 publication informed EPA that PFOS was present in the blood of the general population, then why would it be necessary in 1998 to alert the EPA through a formal TSCA 8(e) submission of this information? There is no credible answer for this question.

In fact, and contrary to their argument now, in 1981 3M published a paper in the *exact same scientific journal* as the 1976 Guy and Taves' publication suggesting that what Drs. Guy and Taves found was not a man-made industrial chemical at all but actually an inert naturally occurring substance. [47] Publishing such a paper was designed in an effort, no doubt, to throw the scientific community off the scent, and to keep the EPA from learning it was *actually* a chemical manufactured by 3M at their facility in Decatur, Alabama. Yet, as more fully discussed below in

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[including imports], processes, or distributes in commerce a chemical substance or mixture and who obtains information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment shall immediately inform the [EPA] Administrator of such information unless such person has actual knowledge that the Administrator has been adequately informed of such information." 15 U.S.C. §2607(e).

[46] *See* Pl. Ex. 52, Olsen Dep. Ex. LP193, at 3 (stating that the finding of PFOS in the blood of the general population in 1998 was a "complete surprise").

[47] *See* Pl. Ex. 59, Olsen Dep. Ex. DL884, at 1510.

§ IV.B, 3M had already internally confirmed at their own laboratory that the compound found by Drs. Guy and Taves was, indeed PFOS, yet published this article anyway, knowing it to be false.[48] However, having been advised by counsel, 3M chose instead not to "reveal the true identity," of the compound discovered by Drs. Guy and Taves, that is, that it was, in fact, PFOS.[49]

If the Guy and Taves "story" is notable for anything, it's not 3M's good corporate behavior, but rather its patent attempt to cover up the truth about PFOS being found in the blood of the general population, and to throw Drs. Guy and Taves and the scientific community off the trail of identifying that the organic fluorine that was found in the blood of the general population was in fact 3M's PFOS.[50]

Moreover, even putting aside the question of whether the 1976 publication by Drs. Guy and Taves informed the EPA that PFOS was in the blood of the general population, which Plaintiffs submit, it clearly did not, the uncontroverted testimony in this case is that prior to 2000 when 3M announced its phaseout of its perflouooctanyl chemistries, the DoD did not have actual knowledge that 3M's LightWater AFFF even contained PFOS or PFOA. Without this basic information, the government could never have known of the totality of dangers associated with C8-containing AFFFs, because it did not even know what fluorocarbon surfactant was in 3M's AFFFs. In this regard, Robert Darwin, the former Director of the Fire Protection Division of Naval Sea Systems Command ("NAVSEA"), who is considered the original custodian of MIL-F-24385, testified that he did not know that PFOS was a fluorosurfactant in 3M's AFFF until *after* 2000, and, prior to

[48] *See* Pl. Ex. 56, Gerber Dep. Ex. DL8, at 3M_BELL00054589 (stating that 3M's laboratories' results show that "[PFOS] or its salts matches that presented by Guy and Taves.")

[49] *See* Pl. Ex. 20, Gerber Dep. Ex. LP68, at 3M-BELL00054594 (stating that "3M lawyers urge [the 3M lab] not to release the true identity (PFOS) of the [organic fluorine] compound.")

[50] For further discussion on this point *see* § IV.B, *infra*.

that time, did not have the "slightest idea" what PFOA and PFOS even were.[51] Similarly, John Farley, Director of Test Operations and lead qualifier for AFFF at the Naval Research Lab ("NRL"), testified that prior to 2000, he had never heard of PFOS.[52] If the former custodian of MIL-F-24385 and the lead qualifier for qualification on the Qualified Products List ("QPL")[53] had never even heard of PFOA and/or PFOS prior to 2000, then how could the government possibly have actually known of any dangers or defects associated with the PFOS or PFOA contained within 3M's LightWater AFFF?

Finally, 3M's failure to disclose to the United States the totality of its knowledge about AFFF and PFOS, and the material nature of those misrepresentations, is substantiated by the testimony of the United States witnesses in this case. For example, [redacted].[54] This confirms that the government would have acted differently had 3M appropriately warned the government of knowledge it had concerning dangers associated with PFOS and PFOA that were unknown to the government. Instead, 3M subverted the government's ability to employ its discretion over the design of AFFF, which contradicts the very purpose of affording it immunity.

[51] *See* Pl. Ex. 2, Darwin Dep. Tr. Vol. I, at 109:6-21 (testifying that prior to 2000, he did not know that PFOS was a fluorosurfactant in 3M's AFFF, had never heard of PFOS, and did not have the "slightest idea" what PFOA and PFOS were).

[52] *See* Pl. Ex. 35, Farley Dep. Tr. Vol. I, at 89:15-24 (confirming he learned that PFOS was in 3M's MilSpec AFFF in approx. May 2000).

[53] As the Court well knows, the QPL is a list of products deemed to have met the requirements stated in the applicable specification, regulation, etc., here the applicable military specification is MIL-F-24385.

[54] *See* Dep. Tr. of Robert Darwin (Vol. II), dated Apr. 29, 2021, attached to London Decl. as Ex. 142, at 354:21-355:13.

B. The Telomer Defendants' Behavior Does Not Justify Immunity.

Rather than follow 3M's lead and make efforts to reduce the public's exposure to C8 chemicals, the Telomer Defendants rushed in to fill the void left by 3M's phaseout of C8 chemistries in the early 2000s. In doing so, these Defendants perpetuated their own false and misleading crusade to show that their telomer-based AFFFs were different than 3M's AFFF and did not, therefore, pose the same dangers. In short, the Telomer Defendants outright lied to AFFF users by claiming that their products did not contain PFOS, PFOA, and/or their precursors. In making these false representations, the Telomer Defendants misled the government into believing that the telomer-based AFFFs were a "solution" [55] to the PFOS "problem."[56] To carry out their campaign of deception, the Telomer Defendants formed an industry alliance called the Fire Fighting Foam Coalition ("FFFC"),[57] which was created for the express purpose of, *inter alia*, communicating with regulatory authorities, including EPA, the DoD, and the general public.[58] Over the years, the FFFC (of which each of the moving Defendants is or was a member) gave various presentations, issued press releases, and promulgated other communications repeatedly

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[55] *See* Pl. Ex. 70, Walker Dep. Tr. Vol. I, who worked for the Air Force for 40 years and is the Chief Fire Protection Engineer for the Air Force, at 173:19-175:24 (testifying that he understood telomer-AFFF to be a "solution set" to the PFOS problem).

[56] *See* Pl. Ex. 9, Walker Dep. Ex. DL156, at 3M_BELL01511648.

[57] One government witness testified that he commonly referred to the FFFC as a "cartel." *See* Pl. Ex. 35, Farley Dep. Tr. Vol. I, at 115:23-116:5. [redacted]. *See* Pl. Ex. 113, Dep. Tr. of James Devonshire, at 72:16-19.

[58] *See* Regina Dep. Ex. DL517, attached to London Decl. as Ex. 143, at AFFF-MDL-CHE-00000913-14 ([redacted]); *see also* Pabon Dep. Ex. DL657, attached to London Decl. as Ex. 144, at FFFC016183 ([redacted]); Hubert Dep. Ex. LP758, attached to London Decl. as Ex. 145, at AFFF-MDL-CHE-00004462 ([redacted])(emphasis added).

reassuring all interested parties that telomer-based AFFFs are safe and do not contain PFOS, PFOA, and/or their precursors. [redacted],[59] knowingly omitting that the telomer-based AFFFs *degrade* to PFOA in the environment.[60]

As discussed below, [redacted]."[61] Clearly, the campaign to convince the government of the safety of their AFFFs, and that they did not contain or degrade to PFOA, was effective. Such evidence is highly relevant to the very question of what the government was told and what it knew vis-à-vis industry knowledge. The Telomer Defendants' campaign of deception leads once again to this litigation's core question: how can it be said that the government continued to use telomer-based AFFFs knowing of the potential for harm from PFOA exposure if it was unaware that telomer-based AFFFs contained or could degrade to PFOA in the environment, and, in fact, was led to believe the contrary?

In addition to asserting half-truths through the voice of the FFFC, individual Telomer Defendants also made these same assertions. For example, [redacted]

[59] *See* Regina Dep. Ex. DL517, Ex. 143, at AFFF-MDL-CHE-00000911; *see also* Regina Dep. Ex. DL464, attached to London Decl. as Ex. 146, at NF000165533 ([redacted]")

[60] *See, e.g.*, Regina Dep. Ex. DL461, attached to London Decl. as Ex. 147, at Kidde_Defendants_00069655.

[61] *See* AFFF-MDL-EID-06608864, [redacted], attached to London Decl. as Ex. 148; *see also* Navy02-00002576, attached to London Decl. as Ex. 149, at Navy02-00002579 (FFFC press release stating in sum and substance that telomer-based AFFFs are not a likely source of PFOA in the environment).

[redacted]."[62] [redacted]

[redacted]."[63] These half-truths interfered with the government's understanding of the dangers posed by C8-containing AFFFs and its discretionary decision to utilize AFFF products. Absent assurances that "the government, and not the contractor, is exercising discretion in selecting the design,"[64] immunity under the GCD should not be available. Because the government lacked knowledge that it was using AFFFs that contained PFOA precursors that could degrade into PFOA and/or PFOS, the Defendants cannot assure it knowingly continued to use AFFFs containing PFOA or PFOS in the first place, let alone knowingly used such foams with actual knowledge of the harms such foams present. At the very least, the telomer Defendants' misrepresentations, coupled with the testimony of many of the government witnesses who relied on those misrepresentations, present genuine issues of material fact as to whether or not the government had actual knowledge that the AFFFs on the QPL contained PFOA and/or its precursors that could degrade into PFOA, and/or that it continued to use such AFFFs knowing of an actual risk of harm.

Despite the Telomer Defendants distancing themselves from PFOA and/or its precursors, internal and confidential industry documents from 2001 make clear that the telomer industry knew, and, in fact, considered it to be "common knowledge" within the industry, that the C8 compounds

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[62] *See* Pl. Ex. 111, Novac Dep. Ex. DL1134, at AFFFTC00418728.

[63] *See* Regina Dep. Ex. DL480, attached to London Decl. as Ex. 150, at NF000063181.

[64] *Miller v. Diamond Shamrock Co*., 275 F.3d 414, 419 (5th Cir. 2001), quoting *Stout v. Borg-Warner Corp*., 933 F.2d 331, 334 (5th Cir. 1991).

used in their AFFFs degrade to PFOA in the environment.[65] Their failure to share their internal information with the DoD (which was unaware of the information) dooms their entitlement to immunity.

C. Defendants' References to Trace Unintended Levels of PFOA Fail to Address the Actual Defect Posed by the Intended Use of C8's that degrade to PFOA.

In their motions for summary judgment, the Telomer Defendants repeatedly misrepresent Plaintiffs' claim, deliberately conflating two distinct concepts: (1) trace unintended levels of PFOA that have not caused widespread PFOA contamination (the equivalent to 0.0000015% of the product for example);[66] and (2) the Defendants' *intended* use of PFOA and/or their precursors in quantities *far greater than* trace inconsequential levels – sometimes comprising 100% of the surfactant itself and no less than 23%.[67] Again, Plaintiffs are not claiming that *trace levels* of unintended PFOA byproduct produced through the telomer manufacturing process are the defect in C8-containing AFFFs. Rather, Plaintiffs claim that the defect at issue with respect to C8-containing AFFFs is the much *larger* percentages of *intended* PFOS, PFOA, and/or PFOA precursors (ranging from 25% to 100% of the fluorosurfactant) that have caused the widespread PFOA and PFOS contamination that exists today.[68] Had these compounds not been used, and in

[65] *See* Regina Dep. Ex. DL461, Ex. 147, at Kidde_Defendants_00069655 (stating in 2001 that the "common understanding of telomer-based fluorosurfactants is that they break down to carboxylates. Most of the telomer products would also have mixed distributions, so that rules out breaking down to only PFOA.").

[66] *See* Expert Report of Plaintiffs' Expert Gregory M Walton, P.E., an excerpt of which is attached to the London Decl. as Ex. 151 at 19-20; *see also*, Fiedler Dep. Ex. DL1721, attached to the London Decl. as Ex. 152, at AGCCA-AFFF-00006914.

[67] While empirically speaking it is true- there are unintended trace levels of PFOA even in today's 99% based C6-telomer AFFFs, these trace amounts have no effect on performance and are inconsequential in terms of the contribution to the widespread contamination that exists today. *See* Expert Report of Gregory M. Walton, P.E., Ex. 151, at 5.

[68] It is undisputed that the Telomer Defendants used fluorosurfactants containing C8/PFOA precursors in percentages ranging between 23% to 100%. *See* Pl. Ex. 118, Dep. Tr. of Eduard Kleiner, at 316:14-22 (testifying that DX2200 is 100 percent C8 based); *see also* Regina Dep. Ex. DL247, attached to London Decl. as Ex. 153, at Kidde_Defendants_00151888 (stating that DuPont's fluorosurfactant 1157N is 23% C8-based), far greater than the trace unintended levels that are a fraction of even one percent. *See* Expert Report of Gregory M. Walton, Ex. 151, at 5, 17-24.

their place, a safer 99% C6-based fluorosurfactant, logic dictates that the widespread PFOA and PFOS contamination that exists in the world today would not have occurred, as it is undisputed that C6-based foams cannot degrade to PFOA.[69]

The Telomer Defendants argue that "the government was aware by no later than 2000 or early 2001 that the telomer MilSpec AFFF contained trace levels of PFOA…"[70] This argument is a red-herring. Defendants are misstating Plaintiffs' position. To be clear, it is the intended use of PFOA and PFOA precursors that is the defect at issue here for the Telomer Defendants. The record is also clear that it was feasible to have utilized the safer C6 alternative that meets MIL-F-24385 as early as 1982.[71] Defendants' failure to manufacture these products has resulted in countless water providers, including all three bellwethers in this litigation, having PFOA (and PFOS) contamination far exceeding the EPA's Health Advisory Limit ("HAL") of 70ppt.

D. The DoD Defers to EPA, The Federal Agency Statutorily Charged with the Responsibility for Conducting Formal Chemical Risk Assessments, To Guide its Management Decisions in their Use of Potentially Hazardous Substances

The EPA is the agency statutorily charged with the responsibility of conducting formal chemical risk assessments.[72] Accordingly, it is the DoD's policy to rely on the EPA, the agency charged with the responsibility for making such risk assessments, to guide it in making its

[69] *See* Ublacker Dep. Ex. DL1074, attached to London as Ex. 154, at p 12 ([redacted]); *see also* Novac Dep. Ex. DL1126, attached to London Decl. as Ex. 155, at AFFFTC00196372 ([redacted] ; Pl. Ex. 79, Dep. Tr. of Philip J. Novac (Vol. I.), at 81:20-84:7; Pls.' Original Opp. at n.159.

[70] *See* Telomer Defs.' Mem. at 6-7.

[71] *See* Expert Report of Gregory Walton, P.E., Ex. 151, at 5, 17-24; Pl. Ex. 23, Decl. of Gregory M. Walton, P.E., at 3, 15-17.

[72] TSCA §6(b)(4), which, "requires EPA to establish by rule a process to conduct risk evaluations. Specifically, EPA is directed to use this process to determine whether a chemical substance presents an unreasonable risk of injury to health or the environment without considerations of costs or other risk factors including an unreasonable risk to a potentially exposed or susceptible subpopulation identified as relevant to the risk evaluation identified as relevant to the risk by the Administrator under the conditions of use." *See* 15 U.S.C. § 2605(b)(4)(A).

management decisions regarding the use of potentially hazardous materials.[73] With respect to PFOA and PFOS, that relevant risk assessment did not occur until 2016, when the EPA issued its HAL, at which time the DoD immediately instituted a policy to remove and replace legacy foams containing PFOA, PFOS and/or their precursors.[74]

The risk assessment process, as outlined by the American Chemistry Society ("ACS"), of which numerous Defendants are members, is a lengthy one that involves: (1) hazard identification, (2) a dose response assessment, (3) an exposure assessment, and (4) a risk characterization.[75] The first step requires identifying adverse effects posed by an exposure, the second step requires a quantification of dose and effect, the third step assesses the exposure pathways, and the final step integrates the information from the first three steps to "generate an estimate of the overall risk to human or environmental health, and integrates uncertainty findings from the first three steps."[76]

As discussed below, determining whether a chemical presents latent risks to human and environmental health by engaging in a full risk assessment is highly distinguishable from identifying an apparent mechanical defect (like a broken helicopter rotor, missing rearview mirrors, or frayed parachute cables) by visual inspection. This concept further distinguishes this litigation from previous cases where governmental immunity has been successfully invoked.[77]

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[73] *See* Pl. Ex. 5, Decl. of Janet K. Anderson, Ph.D., at 11 of Ex. A (citing DODM 4715.20 4.b(5)(b) P35 & 47.18).

[74] *See* Pl. Ex. 97 at PENNA-NAVY-017115 (stating that the Department of the Navy "intends to remove, dispose and replace legacy AFFF that contains PFOS and/or PFOA…); *see also* Pl. Ex. 96 (Dept. of Air Force Memo directing replacement of C8 legacy AFFF and replacement with C6 AFFF, Aug. 22, 2016).

[75] *See* American Chemical Society Public Policy Statement 2019-2022: Chemical Risk Assessment and Regulatory Decision Making, attached to London Decl. as Ex. 156, at 1.

[76] *See id*.

[77] Even in *Agent Orange*, which involved a chemical, it was undisputed that the government had known since the 1950's that even trace amounts of dioxin found in the product were toxic. Thus, there was no disparity in knowledge between government and government contractor at the time of the events. "During the 1950s and 1960s the PHS (the United States public health service) developed considerable expertise on dioxin's toxicity; and dioxin's potential presence as an unintended by product in the production of 2,4,5-T. *Agent Orange*, 304 F. Supp. 2d 404, 426-27 (E.D.N.Y. 2004). At the time it developed specifications for agent orange the United States knew that 2,3,7,8-

Here, in a case dealing with toxic exposures, it takes years before actual knowledge of an alleged defect can be known by the government. In sum, chemicals pose inherently hidden dangers, the hazards of which sometimes remain unknown for decades, at least for those outside of the manufacturers.

The evidence herein is replete with documents and testimony supporting this fundamental premise – that the DoD is required to rely on the EPA – and for good reason. For example, an Air Force Public Statement makes clear, "(t)he Air Force depends on the EPA and the Department of Health and Human Services Agency for toxic substances and disease registry to determine potential danger to human health and the environment."[78] That Statement also notes that, "(t)he EPA issued its lifetime health advisory in 2016 at the current level and the Air Force has adjusted its response to meet that new level," and explains that "(t)he Air Force relies on the EPA to address and set environmental regulatory limits for human health…" precisely because "(t)he EPA conducts rigorous peer-reviewed processes to establish risk levels for chemicals and used several hundred studies that resulted in the drinking water advisory we had today."[79]

Mark Correll, the assistant secretary for the Air Force overseeing environmental concerns, put it this way in reference to EPA: "We rely on agencies that do this for a living to give us answers."[80] Accordingly, in 2016 following the issuance of the Lifetime Health Advisory

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tetrachlorodibenzo-p-dioxin (dioxin) was at the time formed as a byproduct during the manufacturer of TCP the intermediate used to produce 2,4,5-T (Agent Orange) and that dioxin was also present in 2,4,5,-T. *Id.* at 427. "It also knew that dioxin was believed to be toxic." *Agent Orange*, *Id.*

[78] *See* Bowling Dep. Ex. DCC676, attached to London Decl. as Ex. 157, at AF09-00019463 (US Air Force Public Affairs statement dated Nov. 20, 2017).

[79] *See id*.

[80] *See* Walker Dep. Ex. DL1380, attached to London Decl. as Ex. 158, at Navy02-00009228; *see also* Pl. Ex. 70, Walker Dep. Tr. Vol. I, at 255:2-256:3 (agreeing with the quoted statement from Walker Dep. Ex. DL1380).

("LHA",) the DoD immediately took action to discontinue using AFFF products associated with PFOS and PFOA, stating as follows:

> On May 19, 2016 the US Environmental Protection Agency (EPA) issued reference (c) to provide a lifetime drinking water health advisory for PFOS and PFOA which are contained in older formulations of AFFF. The newest formulations of MILSPEC-compliant AFFF (i.e., products qualified since November 2015) may still contain trace quantities of PFOA. DON (Department of the Navy) intends to *remove*, *dispose* and *replace* legacy AFFF that contains PFOS and or PFOA…."[81] (emphasis added)

In a 2018 report to Senator John McCain, Chairman of the Committee on Armed Services forces, the Undersecretary of Defense, Ellen Lord reported "(a)n update on DoD's plans for replacing AFFF containing PFOS or PFOA at military installations across the country and methods of disposal for AFFF containing PFOS or PFOA."[82] The Undersecretary of Defense went on to note that it was the May 19, 2016 EPA's LHA of 70ppt which prompted this action, stating: "While the LHA is only guidance under the SDWA and not a required or enforceable water standard DoD began taking actions to address impact of drinking water." She also reiterated that, "(a)s part of DOD's multifaceted approach to address PFOS and PFOA the department is also taking steps to *remove and replace* AFFF containing PFOS from its inventory and supply system." (Emphasis added)

In sum, "DoD reliance on EPA in matters of chemical regulation as it relates to human health is a well-founded principle that provides for a deliberative and thoughtful process and ensures that DoD's decisions are guided by and based on the best available science, thus avoiding reliance on potentially conflicting data."[83]

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[81] *See* Pl. Ex. 97 at PENNY-NAVY-017115.

[82] *See* Def. Ex. 131 at FF_DOD004_00002989-990.

[83] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., ¶ 18.

E. Defendants' Conduct Resulted in a Decades-Long Delay in the Regulatory Process Culminating in the EPA's 2016 Health Advisory Level ("HAL").

As noted above, the federal regulatory process with respect to chemical evaluation and risk assessment, the dangers of which are often latent and thus unknown for years, is a long and lengthy one,[84] even where no informational gaps exist. In the case of AFFF, Defendants' conduct clearly resulted in not only a decades long delay in the *start* of that lengthy process, but also impeded the regulatory process even after the process began.

Initially, it is clear that 3M's 20-plus year failure to disclose to EPA the presence of PFOS in the blood of general population delayed the regulatory process with respect to PFOS and PFOA. In fact, the record establishes that it was, in fact, the reporting of PFOS in the blood of the general population that prompted EPA to investigate PFOS in 2000. This is evidenced by, for example, one correspondence from Charles Auer in the EPA's Office of Pollution Prevention and Toxics ("OPPT") to Scott A. Masten, Ph.D., in the National Institute of Environmental Health Sciences, dated August 7, 2003, where Mr. Auer stated that "OPPT has been assessing perfluorinated compounds since 1999. ***This interest was prompted by reports submitted to the agency describing the toxic properties and widespread presence in the environment***, including human populations, of… [PFOS]."[85] Similarly, in 3M's press release related to its settlement with EPA resulting from reporting violations under TSCA, it is stated that "[d]ata submitted by 3M and others led EPA to <u>*begin*</u> an investigation of [PFOA and PFOS] in ***2000***."[86]

However, this 20-plus year delay by 3M in the disclosure to EPA that PFOS had been found in the blood of the general population was not the end of industry obstruction and delay.

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[84] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., at 7-8 (stating that hazard assessment practice is a formal and deliberative process within the regulatory framework).

[85] *See* Pl. Ex. 51 at 3M_AFFF_MDL01669634 (emphasis added).

[86] *See* 060-0036-0000321, attached to London Decl. as Ex. 159, at 060-0036-0000324 (emphasis added).

Rather, as noted above, even after the regulatory process for PFOA and PFOS began around the year 2000, industry nonetheless continued to impede the progress of EPA's information gathering with respect to PFOA and PFOS both by withholding critical risk information well into the 2000s as well as through its mantra of denials regarding hazards posed by PFOS and PFOA.

For example, as discussed above, the telomer industry embarked on a 15-year campaign of deception claiming that their AFFFs did not contain PFOA, PFOS or their precursors, a representation that was reasonably relied upon by the government. Moreover, in 2005 and 2006, Defendant E.I. DuPont de Nemours and Co. ("DuPont") and 3M, respectively, were each fined substantial penalties for failing to disclose "significant risk information" regarding both PFOA and PFOS.[87] In fact, as noted above, in 2006, the then EPA Administrator, Stephen Johnson, noted in regard to PFOA that there are "many . . . critical information gaps that exist around our understanding of potential exposures and risks."[88]

The repeated failures by Defendants to disclose significant risk information prevented EPA from adequately assessing the risks associated with PFOS and PFOA utilizing the widely recognized *weight of the evidence* approach.[89] EPA defines weight of evidence as follows: "(1) A process of making inferences from multiple pieces of evidence, adapted from the legal metaphor of the scales of justice. (2) The relative degree of support for a conclusion provided by evidence. The result of weighing the body of evidence."[90] Having been deprived of substantial risk

[87] *See* Apr. 25, 2006 EPA Press Release, Ex. 130; *See* Dec. 14, 2005 EPA Press Release, Ex. 131.

[88] *See* Def. Ex. 106 at FF_NAVY11_00432968.

[89] *See* EPA's Procedures for Chemical Risk Evaluation Under the Amended Toxic Substances Control Act, available at: https://www regulations.gov/document/EPA-HQ-OPPT-2016-0654-0108 (last visited June 17, 2022).

[90] *See* OECD (2019), *Guiding Principles and Key Elements for Establishing a Weight of Evidence for Chemical Assessment*, Series on Testing and Assessment No. 311, Environment, Health and Safety Division, Environment Directorate (citing EPA's 2016 definition for "weight of the evidence"), attached to London Decl. as Ex. 160, available at: https://www.oecd.org/chemicalsafety/risk-assessment/guiding-principles-and-key-elements-for-establishing-a-weight-of-evidence-for-chemical-assessment.pdf (last visited June 17, 2022).

information for decades, even well into the 2000s, the EPA was not in a position to have fairly weighed all of the evidence of harms associated with PFOS and PFOA. Simply, the EPA was deprived of substantial risk information, which had it been provided, would have undoubtedly been considered as part of its weight evidence analysis, or metaphorically speaking, placed on the scales of justice. Resultantly, this substantial risk information would have been incorporated sooner into a risk assessment for these chemicals had such information been provided. However, given the EPA's informational gaps relating to PFOA and PFOS, it is no wonder that in 2009, when the EPA issued its provisional health advisory level for PFOA and PFOS, it noted that epidemiological studies concerning PFOA and PFOS exposure and adverse health outcomes were still "inconclusive."[91]

Since 2000, there has been a significant increase in the number of publications related to PFOS and PFOA.[92] In fact, from 2009 onwards, one can see an even more dramatic increase in publications relating to PFOS and PFOS,[93] including the publication of the C8 Science Panel studies, the largest scale epidemiological study regarding exposure to PFOA and human health effects.[94] This is important because almost all of these publications were only published following 3M's disclosure to EPA of PFOS being found in the blood of the general population, and only then became part of the body of scientific literature available to EPA in performing its weight of the evidence analysis in order to arrive at the 2016 HAL of 70 ppt. Again, this subsequently triggered

[91] *See* Pl. Ex. 120, Provisional Health Advisories for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS), at 1.

[92] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., at 13 (identifying the number of Per- and Polyfluoroalkyl Substances Publications in PubMed from 1980-2021).

[93] *See id*.

[94] *See, e.g.*, C8 Science Panel's Probable Link Evaluation of Cancer, dated Apr. 15, 2012 (concluding that "on the basis of the epidemiologic and other data available to the C8 Science Panel, we conclude that there is a probable link between exposure to C8 (also known as PFOA) and testicular cancer and kidney cancer….), attached to London Decl. as Ex. 161, at 1.

DoD's immediate reaction and implementation of a program to remove and replace existing stocks of legacy foams containing either PFOS or PFOA (except for those inconsequential trace levels).[95]

In sum, the evidence clearly demonstrates that at all times, over a span of 50 years, the government has faced a torrid current of industry denials and concealment of key risk information.

As discussed in greater length below, each of the Defendants, whether it be 3M or any of the Telomer Defendants, possessed knowledge they failed to disclose to the government regarding the toxicity and safety of PFOS, PFOA, and AFFF more generally, thereby delaying the regulatory process by decades.[96] Thus, it cannot have been before 2016, when the EPA (upon whom by regulation the DOD is required to rely for risk information to guide its management decisions regarding potentially toxic chemicals[97]) issued its 2016 LHA, that DoD had actual knowledge of the dangers posed by PFOA and PFOS to humans, and thus AFFF more specifically.

Finally, in their respective declarations, Drs. Linda S. Birnbaum and Janet K. Anderson, with combined decades of service at EPA, explained and concluded that until the formal risk assessment was completed by EPA in 2016, it cannot be said that the government had actual knowledge of the potential risk of harms associated with PFOA and/or PFOS such that the DoD could have made informed and well-found management decisions regarding the use of AFFFs.[98] These well- supported conclusions, at the very least, present triable issues of fact as to whether it

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[95] *See* Pl. Ex. 97 at PENNA-NAVY-017115 (stating that the Department of the Navy "intends to remove, dispose and replace legacy AFFF that contains PFOS and/or PFOA….")

[96] *See also* Pls.' Original Opp. § IV.B.5.

[97] *See* 42 U.S.C. §§ 9601(2), 9620 (a); Pl. Ex. 123, DoD Manual 4715.20, Enc. 2 (1)(a), Enc. 3 (1)(a), (b). DOD Manual § 4715.20 (March 9, 2012), available at https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodm/471520m.pdf (last visited June 17, 2022); Pl. Ex. 5, Decl. of Janet K. Anderson, Ph.D., at 15 of Ex. A (DoD manual DODM 4715.20 and "DoD policy for unregulated and emerging contaminants (DoDI 4715.18) provides rules and requirements that specifically prohibits DoD from adopting protocols and procedures based on draft/proposed regulatory guidance that is undergoing peer review and comment").

[98] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., ¶¶ 20-23; *see also* Pl. Ex. 5, Decl. of Janet K. Anderson, Ph.D., at Opinion 2, at 2 of Ex. A.

was, in fact, 2016, at earliest when DoD had knowledge about dangers posed by C8-containing AFFFs, and their testimony, opinions and credibility in this regard are properly weighed by the trier of fact.

Importantly, these are not the opinions of just run-of-the mill toxicologists without experience in the subject matter. Rather, as noted above, both Drs. Anderson and Birnbaum worked at EPA. Dr. Anderson spent 15 years providing toxicology expertise and consulting to federal agencies[99] while Dr. Birnbaum served the EPA for 19 years from 1989 to 2009.[100] After her time as a post-doctoral fellow at EPA's Office of Research and Development National Center for Environmental Assessment, Dr. Anderson went on to lead the Emerging Contaminants program at the United States Air Force, where she advised the DoD on matters related to regulatory actions, toxicology, risk assessment and environmental restoration.[101] Dr. Birnbaum, after 19 years at EPA, went on to become Director of the National Institutes of Environmental, a position she held through both Democratic and Republican administrations, testifying multiple times before the United States Congress on issues germane to the protection of the public and the environment from dangerous chemicals.[102] These are the opinions, therefore, of experts who have served our country, dedicated their careers to protecting the public health an particularly with professional experience directly relevant to the issues in this case.

As discussed, unlike a mechanical defect where the defect is open and obvious, chemicals by their very nature present questions of fact that require expert opinion and interpretation to assist the finder of fact in answering the ultimate question as to when it can be said that sufficient

[99] *See* Pl. Ex. 5, Decl. of Janet K. Anderson, Ph.D., at 1 of Ex. A.

[100] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., at Attachment A.

[101] *See* Pl. Ex. 5, Decl. of Janet K. Anderson, Ph.D., at Appendix A, at 1.

[102] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., ¶¶ 1-8.

knowledge existed to conclude that a chemical used in a particular product, like AFFF, presented an actual risk of harm of humans. According to both Drs. Birnbaum and Anderson, it was not until at least 2016 when one can say the government, and specifically the DoD, had the requisite knowledge of the potential harm to humans from their ordinary use of AFFFs. This conclusion draws from their professional knowledge, experience and the underlying facts of the case, and is a conclusion that at least creates a triable issue of fact as to when DoD had sufficient and actual knowledge of these harms.

F. In the Absence of a Precise Specification, there is no Reason to Reach the Second and Third Prongs of *Boyle*

While *all three* Boyle prongs are intertwined, it is important to underscore why Defendants have failed to even meet *Boyle* prong one prior to advancing to any analysis of prong two or three. Only if prong one is met is an analysis of the remaining *Boyle* prongs necessary.

MIL-F-24385 is a "performance" specification, which means it does not provide a specific recipe for the constituents of AFFF.[103] Notably, the government agrees. Mr. Darwin, the former custodian of MIIL-F-24385, testified that it is a performance specification.[104] There was simply no requirement that any specific fluorosurfactant be incorporated into AFFF so long as the AFFF passed the fire testing protocols. In fact, the government was unaware of which fluorosurfactant was even used in any particular AFFF because such information was maintained as a trade

[103] *See, e.g.*, *Strickland v. Royal Lubricant Co*., Inc., 911 F. Supp. 1460, 1468 (M.D. Ala. 1995) (court rejected claims of immunity by the manufacturer of hydraulic fluid because the specification at issue was imprecise as being silent as to toxicity which afforded the manufacturer "considerable discretion" to select its components: "**The specifications here, unlike those in *Glassco*, [ ] provide considerable discretion to the contractor in formulating the components of the product.** In *Glassco*, the contractor had little, if any, leeway in constructing the belt, which could only be made of one material and with specificized measurements. Here, however, the confines were not restricted as to the degree of toxicity, giving the defendant wider latitude. As already stated, one purpose of the government contractor defense is to alleviate a manufacturer's dilemma when it cannot alter a component of a product but must produce it strictly in compliance with government specifications. This does not seem to be the case here.") (emphasis added)

[104] *See* Pl. Ex. 2, Darwin Dep. Tr. Vol. I, at 41:6-42:10.

secret.[105] Thus, the characterization of the AFFFs by Mr. Darwin as each company's proprietary "witches' brew."[106]

This paradigm is in stark contrast to, for example, the military specification at issue in *Agent Orange*, which *does* specify a precise chemical within a larger family of chemicals. For illustrative purposes, a side-by-side comparison is included below.

Agent Orange Mil-Spec

3. REQUIREMENTS

3.1 Materials. The herbicide shall be composed of the following two ingredient materials.

a. N-Butyl 2,4,5-Trichlorophenoxyacetate

b. N-Butyl 2,4-Dichlorophenoxyacetate

3.1.1 The ingredient materials shall meet the following specifications:

a. Specification MIL-H-51148, N-Butyl 2,4,5-Trichlorophenoxy-acetate, except free acid will be 0.5% by weight.

b. Specification MIL-H-51147, N-Butyl 2,4-Dichlorophenoxyacetate except composition (purity) shall be 98% minimum by weight, acid equivalent shall not be less than 79.0% nor more than 80.0% and free acid shall be 0.5% maximum by weight.

AFFF Mil-Spec

3. REQUIREMENTS

3.1 Qualification. Liquid concentrate fire extinguishing agents furnished under this specification shall be products which are qualified for listing on the applicable Qualified Products List at the time set for opening of bids (see 4.3 and 6.3).

3.2 Material. The concentrate shall consist of fluorocarbon surfactants plus other compounds as required to conform to the requirements specified hereinafter. The material shall have no adverse effect on the health of personnel when used for its intended purpose.

As is plain to see, when the government chooses to do so, the government knows exactly how to specify and require a specific chemical. N-Butyl 2,4,5- Trichlorophenoxyacetate and N-Butyl 2.4-Dichlorophenooxyacetate are specific chemicals within the larger class of thousands known as herbicides or defoliants. In § 3.1.1 of the Agent Orange military specification, there are even greater and more carefully defined specifications, including the precise weight and

[105] *See* Pls.' Original Opp. at 31-33.

[106] *See* Pl. Ex. 2, Darwin Dep. Tr. Vol. I, at 46:23-47:2.

percentage of purity for each chemical. There is very simply no such equivalent to this precision of detail in MIL-F-24385. The AFFF MilSpec merely identifies a large class of compounds (i.e., fluorosurfactants) for the contractor to choose from without regard to any particular fluorosurfactant of the many thousands that exist, thus permitting the contractor to use its discretion in selecting fluorosurfactant(s) and keep the identity of its fluorosurfactant(s) unknown as a propriety trade secret.[107] Because it is the contractor that is exercising discretion in selecting the design of the product, not the government, immunity does not follow.

G. Defendants' Knowledge Exceeded that of the Government

Defendants, in particular the Telomer Defendants,[108] also make the specious argument that the government's knowledge *always* exceeded their own. As an initial matter, "[o]ne of the most fundamental propositions of negligence law in the products liability context is that a manufacturer is held to the level of an expert in its field."[109]

Given their expertise over their products, it is generally understood that industry is always presumed to be in a superior position of knowledge of its own products, which is demonstrably the case here.[110] Defendants' attempts to avoid their actual knowledge of AFFF's propensities rings hollow.

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[107] *See* Pl. Ex. 1, Decl. of Patrick D. Lowder, at 3-4 (stating that the term fluorocarbon refers to a family of chemicals that encompasses trillions of potential compounds and NRL did not select or develop the fluorosurfactant compounds utilized in AFFF formulations). It is also worth noting that MIL-F-24385 does require specific chemicals by name in and weight.

[108] Telomer Defs.' Mem. at 8.

[109] *See* 1 Owen & Davis on Prod. Liab. § 2:8, *The standard of care—Manufacturers held to standard of "expert in the field"* (4th ed. 2022) (citing *Chretien By & Through Chretien v. Gen. Motors Corp*., 959 F.2d 231, *10-11 (4th Cir. 1992.))

[110] *See, e.g., Huggins v. Stryker Corp.,* 932 F. Supp. 2d 972, 987 (D. Minn. 2013) (a manufacturer is "obligated to keep informed of scientific knowledge and discoveries concerning that field."); *Hollman v. Taser Intern. Inc*., 928 F. Supp. 2d 657, 678 (E.D.N.Y. 2013) (manufacturer "must keep abreast of knowledge of its products as gained through research, adverse reaction reports, scientific literature and other available methods."); *Erickson v. Baxter Healthcare, Inc.,* 151 F. Supp. 2d 952, 962 (N.D. Ill. 2001) (manufacturers are held to standard of experts in the field).

For example, beginning in 1998, 3M and DuPont submitted millions of pages of studies on PFOS and PFOA to the EPA's administrative docket, titled AR-226, which had accumulated for decades. The number of studies they submitted in 1998 alone were in the thousands as compared to the handful of DoD studies the DCC cited in its original brief (the interpretation of which was supported by mere self-serving attorney statements and not a single expert affidavit), which in any event were not of the type, quality, quantity, or character to permit a risk assessment, and the majority of which did not even apply to PFOA or PFOS.[111] This evidence alone demonstrates that the level of knowledge overwhelmingly favors industry.

Moreover, the government's knowledge could not have exceeded that of industry since in 2005 and 2006 both DuPont and 3M respectively each agreed to pay EPA significant fines for violations of the Toxic Substances Control Act ("TSCA") in failing to disclose "substantial risk information" with respect to both PFOA in the case of DuPont and both PFOA and PFOS in the case of 3M. This evidence *proves* that Defendants withheld information from the government and establishes unequivocally that the government's level of knowledge of potential risks of PFOA and/or PFOS was, in fact, *substantially less* than that of the industry.

In 2005, Defendant DuPont was fined the largest penalty "by far" ever levied by the EPA specifically for failing to disclose "substantial risk information" regarding PFOA.[112] While DuPont is not a moving Defendant, that is of no moment, as this fine is direct evidence that the government was *not* informed of, and was not privy to, "substantial risk information" about PFOA, which

[111] *See* Pl. Ex. 6, Decl. of Linda S. Birnbaum, Ph.D., D.A.B.T., A.T.S., at 6.

[112] *See* Dec. 14, 2005 EPA Press Release, Ex. 131, at 2 ("This is the largest civil administrative penalty EPA has ever obtained under any environmental statute. Not by a little, by a lot.").

speaks directly to the issue of government knowledge.[113] In short, it is proof that the government lacked not just some knowledge but *substantial* risk information regarding PFOA, which was, in fact, known to industry.[114]

A year later, in 2006, 3M similarly agreed to pay substantial penalties for alleged violations of the TSCA for failing to disclose "substantial risk information" for both PFOS and PFOA.[115] In their press release of April 25, 2006, EPA noted that as a result of EPA's action "… 3M produced valuable *previously unreported* information that will help the scientific community to better understand the presence of toxic substances in the environment."[116]

These EPA actions, resulting in substantial fines paid by both DuPont and 3M, make it abundantly clear that not only was EPA deprived of substantial risk information regarding PFOS and PFOA but so too was the scientific community at large. Accordingly, Defendants' factual contentions that the government was in a position of superior knowledge to industry have been controverted. Consequently, questions of fact remain that must be determined by a jury.

Finally, the Telomer Defendants also claim that the government consistently had superior knowledge than them with respect to the potential for their C8-containing AFFFs to degrade to PFOA.[117]. However, as discussed, in § V.B, *infra*, the record reflects that it as of 2001, it was

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[113] As the Court recalls, during the telephonic conference of April 6, 2022, the Court noted in response to Plaintiffs' concern that Dupont and Dynax would not be parties to this motion: "I know you want to get in information that you believe is misinformation provided by these two defendants. To the extent that it in combination of other information was misleading the Government, I think you can mention that without having me address the issue of their availability for government contractor immunity." *See* Apr. 6, 2022, Hr'g Tr. at 26: 2-8.

[114] Moreover, even if one were to argue that DuPont's knowledge, as a member of the FFFC, cannot be imputed to the other members, this is still direct evidence that the government lacked "substantial risk information" regarding PFOA, evidence relevant to the question of what the government knew and when they knew it, especially as compared to industry

[115] *See* Apr. 25, 2006 EPA Press Release, Ex. 130, at 2.

[116] *See id*. (emphasis added).

[117] *See* Telomer Defendants' Mem. at 15-23.

common industry knowledge that C8-containing AFFFs degrade to PFOA, and, moreover, both individually and through the FFFC, the Telomer Defendants consistently clouded the government's knowledge on this point through misrepresentations that their AFFFs neither contained nor degraded to PFOA. As such, this likewise creates a triable issue of act regarding the timing of government knowledge vis-à-vis the Telomer Defendants insofar as AFFF degradation pathways are concerned, and whether, in fact, government was even aware that use of telomer-based AFFFs could result in PFOA contamination given that they were being told the opposite.

H. The Defendants Bear the Burden to Establish Actual Knowledge on the Part of the Government and Have Failed to Satisfy this Burden

As set forth more fully in section III.B, *infra*, under *Intel Corp. Invest. Policy Comm.,* Defendants have the burden to establish actual knowledge on the part of the government of the dangers posed by AFFF.[118] The Defendants have not satisfied their burden in this regard.

Even to this day, the EPA is busy establishing a final MCL which will carry even greater weight than the health advisory issued in 2016. One could argue, therefore, that even in 2016 the government, or the DoD more specifically, had insufficient knowledge that would have led it to discontinue legacy AFFF use. Nonetheless, in conformance with the precautionary nature of the HAL, DoD began its program to remove and replace legacy AFFFs.

III. LEGAL STANDARDS

The Court should deny Defendants' motion for partial summary judgment regarding its affirmative defense with respect to the second and third prongs of the *Boyle* government contractor defense because they have failed to demonstrate that no genuine issues of material fact exist with

[118] *See also Trevino v. Gen. Dynamics Corp*., 865 F.2d 1474, 1481-82 (5th Cir. 1989) (noting it "would be a farce if the government could approve specifications without evaluating them."); *Ramey v. Martin-Baker Aircraft Co.*, 875 F.2d 946, 951 & n.10 (4th Cir. 1989) (Navy had "full knowledge of the danger implicit in prevailing maintenance protocols.").

respect to their arguments that: (a) their AFFF products conformed to the MilSpec; and (b) that they warned the government of dangers associated with AFFF use known to them but not the government.

Summary judgment is only appropriate if the movant shows that there is *no* genuine dispute as to *any* material fact and the movant is entitled to judgment as a matter of law as to matters upon which it has the burden of proof at trial.[119] "Ordinarily, because of the standard applied at the summary judgment stage, defendants are not entitled to summary judgment pursuant to the government contractor defense."[120]

A. *Second Prong*: Equipment Conformed to Government Specifications

The second prong of the *Boyle* test requires that the product conform to the government's specifications.[121] This prong serves to locate the exercise of discretion in the government; if the contractor were free to deviate from the government's specifications, then discretion over design choices would be exercised by the contractor, not by the government.[122] In such cases where the contractor is the one exercising discretion, immunity is not available. Thus, the contractor must prove that its product met the government specifications in all material respects.[123]

To suggest their products conformed with MIL-F-24385, the Defendants argue that this Court may not second-guess the government's finding their products conformed to the MilSpec based on *Kleeman*. In *Kleeman*, as in *Boyle, Dowd, Tozer and Ramey*, all of the products at issue

[119] *See Celotex Corp. v. Catrett*, 477 U.S. 317, 325 (1986); FED. R. CIV. P. 56(a).

[120] *Coach v. Armstrong Int'l Inc.*, No. CIV.A. 2:12-60180-ER, 2014 WL 7404841, at *1 n.1 (E.D. Pa. Sept. 25, 2014) (denying summary judgment as to *Boyle* prong one because plaintiff had submitted affidavits controverting defendants' evidence as to whether the Navy issued reasonably precise specifications).

[121] *Boyle*, 487 U.S. 500, 512 (U.S. 1988).

[122] *Trevino*, 865 F.2d at 1481.

[123] *Kleeman v. McDonnell Douglas Corp.,* 890 F.2d 698, 702-03 (4th Cir. 1989).

were mechanical in nature. Such products "are precisely the sort for which the defense was intended."[124] And for each product, the "government was a substantial participant."[125] Where those two facts align the Fourth Circuit has no qualms granting immunity due to the "active government oversight" of the development of the product.[126] As the court noted, "[h]ere the government maintained discretion over the design of the product throughout; it did not simply turn over such discretion, and the military decisions inherent therein, to the private contractor."[127] The court also noted the necessity for "detailed, quantitative specifications," which are the only specifications "relevant to the government contractor defense."[128] Any specification with "vagaries" do not fit the Fourth Circuit's relevancy standard applicable to the defense.

Contrasting the facts in *Kleeman* to those here reveals a chasm of uncertainty exists between what is demanded by the Fourth Circuit for a supplier to meet the defense and the situation at hand. The absence of active government participation in the development of 3M's or any of the Telomer Defendants' products, coupled with the lack of any quantitative specification in the AFFF MilSpec, which only contained the simple vagary calling for a "fluorocarbon surfactant," does not meet the demanding standard of the GCD required by *Kleeman*. Instead, the record demonstrates that the government ceded its discretionary authority to the Defendants about which flourosurfactants to use in AFFF, which refutes any possibility that the government found Defendants' AFFF conformed with MilSpec.

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[124] *Id*. at 700; *see also Tozer v. LTV Corp*., 792 F.2d 403, 407 (4th Cir. 1986) (recognizing a back-and-forth between contractor and military as "essential" and "a reality of the procurement process.").

[125] *Id.* at 701.

[126] *Id*. (noting that in the development of the aircraft at issue there were extensive "exchange of views in the procurement process", the contractor "was required to submit detailed engineering drawings," "all changes to the design . . . required Navy approval", and the Navy "maintained an extensive staff of aircraft engineers on site" of the defendant).

[127] *Id*. at 702.

[128] *Id*. at 703.

Defendants' secondary argument that prong two's conformance with the Milspec can be proven by the government's testing and qualification of their products misapplies their authority. The cases relied upon by Defendants, *Miller*, 275 F.3d at 420; *Szigedi v. Ensign-Bickford Co*., No 1:00-CV-00836, 2002 WL 32086774, at * 8 (M.D.N.C. July 15, 2002); *see also Lewis v. Babcock Indus., Inc*., No. 88-CV-1120, 1992 WL 142751, at * 7 (S.D.N.Y. June 8, 1992), address different procurement processes. In contrast, here, the government's lack of actual knowledge of the contents of the products or the ability to fully appreciate the dangers presented by long-chain AFFF negates any argument that the acceptance of the product after testing to meet the QPL was in any way proof of its conformance with the MilSpec.

B. *Third Prong*: Contractor must warn government of any dangers in the use of the product that are known to the contractor but not to the government

The first two prongs of the *Boyle* test assure that the suit falls "within the area where the policy of the 'discretionary function' would be frustrated."[129] The third prong requires that the contractor warn the government of any dangers in the use of the product that are known to the contractor but not to the government.[130] The third prong is necessary "because, in its absence, the displacement of state tort law would create some incentive for the manufacturer to withhold knowledge of risks, since conveying the knowledge might disrupt the contract but withholding it would produce no liability."[131] The primary purpose of this prong is to enable the government to make determinations as to the design and use of the contracted-for product "based on all readily available information."[132] "[I]f a defendant was aware of hazards that might reasonably have

[129] *Boyle*, 487 U.S. at 512.

[130] *Id.*

[131] *Id.*

[132] *Trevino*, 865 F.2d at 1481 (citation omitted).

affected the government's decision about the use of [its product], and if that defendant failed to disclose those hazards to the government, then the defense fails . . . ."[133] Here, ample evidence suggests that had the government known of the dangers posed by long-chain AFFF earlier, it would have discontinued using it sooner.[134]

"[T]he government contractor defense is [only] established as a matter of law absent a *substantial showing* that the manufacturer informed the government of known risks in the use of its product."[135] *Boyle's* third prong is "geared to ensure that the Government makes its decision to contract for that particular equipment with benefit of *full knowledge of all hazards*."[136]

An analysis of *Boyle's* third prong is an inherently fact intensive analysis. As one court recently observed, "[a]n even deeper dive into even murkier factual waters would be required to resolve *Boyle's* second and third prongs in the context of this litigation."[137] In cases where summary judgment was granted on *Boyle's* third prong, typically the facts were not in dispute, no

[133] *Agent Orange*, 534 F.Supp. at 1057-58.

[134] To the extent that Defendants rely on *Glassco v. Miller Equip. Co.,* 966 F.3d 641, 643 (11th Cir. 1992) to argue that the information they withheld from the government would not have impacted its knowledge or decision to discontinue use of their defective AFFF, the record disproves their contentions.

[135] *Carley v. Wheeled Coach*, 991 F.2d 1117, 1127 (3d Cir. 1993) (citing cases) (emphasis added).

[136] *In re Joint E. & S. Dist. N.Y. Asbestos Litig.,* 897 F.2d 626, 632 (2d Cir. 1990) (emphasis added); *see also Tate v. Boeing Helicopters*, 55 F.3d 1150, 1156 (6th Cir. 1995) (contractors are required "to provide the government with all the information required to soundly exercise its discretion.").

[137] *In re 3M Combat Arms Earplug Prods. Liab. Litig*., 2020 U.S. Dist. LEXIS 148321, at *14 n.5 (N.D. Fla. 2020); *see also Hays v. A.W. Chesterton, Inc.*, 2011 U.S. Dist. LEXIS 143493, at *10-11 (E.D. Pa. 2011) (denying summary judgment because plaintiff submitted "evidence that contradicts (or at least appears to be inconsistent with) [defendant's] evidence in support of its motion").

evidence was introduced to refute the defendants' arguments, or the government had greater knowledge of the problem than the defendant had or had issued its own warning.[138,139]

Regarding a government contractor's level of knowledge under *Boyle's* third prong, *Boyle* requires an understanding of the Court's rationale for granting immunity. In particular, the Court wanted to encourage candid discussions between the supplier and the military. To promote such candor, the third prong provides that a supplier must warn the government of dangers "known to the supplier" but not within the government's knowledge.[140] Since *Boyle*, courts have almost uniformly required that there must exist "actual knowledge on the part of the manufacturer"[141] of the dangers presented by their products. This has been demonstrated time and again in ordinary government contractor defense cases, where the dangers presented by the products which are

[138] *See, e.g., Ramey,* 875 F.2d at 951 & n.10 (Navy was "well aware of the [product's] harmful propensities," had "full knowledge of the danger" and there was "no dispute" over critical facts); *Haltiwanger v. Unisys Corp.*, 949 F. Supp. 898, 904 (D.C. Cir. 1996) (evidence showed that government was as well informed, if not more so, than defendant of product's dangers); *Lewis v. Babcock Indus., Inc.*, 985 F.2d 83, 89-90 (2d. Cir. 1993) (same); *Harris v. Rapid Am. Corp.*, 532 F. Supp. 2d 1001, 1006 (N.D. Ill. 2007) (same); *Yeroshefsky*, 962 F. Supp. at 721 ("government's knowledge was both wide and deep"); *Stout v. Borg-Warner Corp.*, 933 F.2d 331, 336-37 (5th Cir. 1991) (the record "demonstrate[d] ***undisputed*** knowledge of the [product's] risk" and the danger was "obvious to anyone") (emphasis added); *Siegman v. Schneider Elec. U.S.*, 2017 U.S. Dist. LEXIS 190485, at *13-15 (D.N.J. 2017) (same); *Kleeman*, 890 F.2d at 702 n.2 (finding ***no evidence*** that defendant failed to warn government of products dangers that were not known to the government); *Maguire v. Hughes Aircraft Corp.*, 912 F.2d 67, 72 (3d Cir. 1990) (record contained ***unrebutted testimony*** that product's risks were disclosed to government); *Niemann v. McDonnell Douglas Corp.*, 721 F. Supp. 1019, 1028 (S.D. Ill. 1989) (plaintiff "presented ***no evidence*** which controverts the ***undisputed fact*** that the government had knowledge of the dangers of asbestos and that the defendant had no such knowledge.") (emphasis added); *Glassco*, 966 F.2d at 643 (summary judgment granted because there was **"*no evidence*"** in the record showing that the defendant knew of dangers which were not known by the government) (emphasis added); *Carley v. Wheeled Coach*, 991 F.2d 1117, 1127 (3d Cir. 1993) (summary judgment reversed where defendant "offered ***no proof*** to satisfy the third prong") (emphasis added); *In re Air Crash Disaster at Mannheim Germany*, 769 F.2d 115, 124-25 (3d Cir. 1985) (***uncontradicted testimony*** establishes Army's knowledge of safety risks and entitled manufacturer to judgment n.o.v.).

[139] The "troublesome issue" that Defendants ascribe to *Ramey* was the duty to disclose information known by a *sub-contractor,* not the contractor itself, to the United States and whether that failure to warn defeated the affirmative defense. *Ramey,* 875 F.2d at 951. Because the government was already "well aware" of the defect, the issue – troublesome as it may have been – was avoided.

[140] *Boyle*, 487 U.S. at 512.

[141] *Stone v. FWD Corp.*, 822 F. Supp. 1211, 1212 (D. Md. 1993).

typically mechanical defects are obvious (*e.g*, helicopter falling out of the sky) and the contractors have proposed alternative "fixes" to address the problem.[142]

But just as prong three of *Boyle* requires actual knowledge of the dangers posed by the product on the part of the supplier, the same knowledge component also applies to the government, *e.g*., "known to the supplier but not to the United States."[143] Of course, this makes sense since courts do not grant immunity from liability for defects that the government has not actually considered or fully evaluated.[144] Consequently, the government must have actual knowledge of the defect for the immunity defense to be effective. [145] This is where the AFFF case proves itself unlike the typical mechanical defect GCD cases cited by the Defendants, or even *Agent Orange,* where the defect is obvious or the toxicity of Dioxin was *already* known to the government. The departure here is the nature of the latent dangers posed by PFOA and PFOS, fluorocarbon surfactants of which the government was not even aware were present in the products (trade secrets), and where the dangers to human health causally associated with PFOA and PFOS were not actually known to the government.

Because the government's actual knowledge compared to the Defendants' is so critical to the immunity defense, understanding what is meant by actual knowledge is critical. In *Intel Corp.*, the Supreme Court defined the term "actual knowledge." Although the term was discussed in the context of ERISA's statutory limitations provision, the Supreme Court's 'plain language' reasoning would apply to any construction of actual knowledge because it was undefined in the

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[142] *See, e.g., Dowd*, 792 F.2d at 411-12.

[143] *Boyle*, 487 U.S. at 512.

[144] *See Trevino*, 865 F.2d at 1481-82 (noting it "would be a farce if the government could approve specifications without evaluating them."); *Ramey,* 875 F.2d at 951 (Navy had "full knowledge of the danger implicit in prevailing maintenance protocols.") .

[145] *See also* Pls.' Original Opp. at 23 n.88 (citing 4th Circuit cases requiring actual knowledge on the part of the government).

statute. The Supreme Court turned to the plain reading of the actual knowledge requirement, concluding that dictionary definitions of "actual" and "knowledge" confirm that to have "actual knowledge" of some information, one must "in fact be aware of it,"[146] and that actual knowledge "begins only when a [party] actually is aware of the relevant facts, not when he should be."[147] The Fourth Circuit applies the same definition of actual knowledge as *Intel* and recognizes that the "appropriate inquiry is fact-intensive."[148] As evidenced by Defendants' motion they place great emphasis on the government's knowledge. But as their evidence is controverted by Plaintiffs' counter-statement of facts laid out below, what remains is a fact-intensive inquiry for a jury to decide.

In this regard, the *Intel* Court also noted two important evidentiary aspects towards proving actual knowledge. The first is that actual knowledge will always be subject to the "usual ways" of proving it, meaning that "[i]nference from circumstantial evidence" will suffice as a proof of fact.[149] Second, the Court noted that actual knowledge can also be proven through a finding of "willful blindness."[150] The High Court recognized that willful blindness occurs when a party "take[s] deliberate actions to avoid learning of that fact.").

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[146] *Intel Corp.*, 140 S. Ct. at 776.

[147] *Id.* at 778.

[148] *Browning v. Tiger's Eye Benefits Consulting*, 313 F. App'x 656, 661 (4th Cir. 2009) ("knowledge of *facts* cannot be attributed to plaintiffs who have no actual knowledge of them," and that "there cannot be actual knowledge of a violation for purposes of the limitation period unless a plaintiff knows 'the essential facts of the transaction or conduct constituting the violation.'") (citing *Edes v. Verizon Commc'ns, Inc.,* 417 F.3d 133, 142 (1st Cir. 2005)); *see also Winburn v. Progress Energy Carolinas, Inc.*, No. 4:11-CV-03527-RBH, 2015 WL 505551, at *7 (D.S.C. Feb. 6, 2015) (recognizing that *Browning* requires that plaintiff had to actually know the facts constituting a violation of the law).

[149] *Intel*, 140 S. Ct. at 779 (citing *Staples v. United States*, 511 U.S. 600, 616 n.11 (1994)) ("[K]nowledge can be inferred from circumstantial evidence").

[150] *Intel*, 140 S. Ct. at 779 (citing *Global-Tech Appliances, Inc. v. SEB S.A.,* 563 U.S. 754, 769 (2011)) (recognizing that willful blindness occurs when a party "take[s] deliberate actions to avoid learning of that fact.")).

In the Fourth Circuit, willful blindness amounts to "purposefully avoid[ing] learning the facts pointing to such liability."[151] Any deliberate action taken to avoid learning facts is willful blindness.[152] Accordingly, the actual knowledge of the Defendants and the United States of the dangers posed by the Defendants' fluorosurfactants to humans can be tested not only through the direct testimony of witnesses, but circumstantial evidence as well. And the credibility of all the witnesses (a jury function) may be examined through the prism of willful blindness. All of this is to say that such factual matters are typically incapable of determination on a motion for summary judgment, which is why the Defendants are unable to meet their burden of proof here and the motion should be denied.

As Defendants suggest, continued use of a product suggests knowledge of that product's dangers. That is true only where that "real world use" reveals its defects, so that the government gains "awareness of all the implications of its operation" including its "shortcomings."[153] Such may be the case with a letter sorter that the Postal Service uses every day,[154] night-vision goggles deployed in flights for years, [155] or a helicopter rotor known to fail.[156] But use of AFFF provides no such information to the military regarding its risks to human health or the environment. By using AFFF, servicemembers learn about its performance characteristics in varied circumstances

[151] *United States v. Jinwright*, 683 F.3d 471, 479 (4th Cir. 2012) (quoting *United States v. Poole,* 640 F.3d 114, 122 (4th Cir. 2011)).

[152] *See United States v. Hale*, 857 F.3d 158, 168 (4th Cir. 2017).

[153] *Haltiwanger*, 949 F.Supp. at 905.

[154] *Id.*

[155] *Zinck v. ITT Corp*., 690 F.Supp. 1331, 1337 (S.D.N.Y,1988) ("Government was using this equipment in flight missions for four years prior to the crash and would have become aware of any limitations or dangers associated with aviation-related use of the goggles.")

[156] *Dowd*, 792 F.2d at 412.

--- not about its persistence, bioaccumulation, toxicity, or potential to inflict human and environmental health.

IV. ARGUMENT IN OPPOSITION TO THE MOTION OF DEFENDANT 3M

Defendant 3M has failed to carry its burden of proof with respect to the second and third prongs of *Boyle* that no genuine issues of fact exist, and thus is not entitled to summary judgment on the Government Contractor Defense.

A. Issues of Fact Exist as to Whether 3M's AFFF Conformed to the MilSpec Precluding Summary Judgment as to the Second Prong of *Boyle*.

Certain AFFF products manufactured by 3M were discovered to be non-conforming to the MilSpec, precluding summary judgment on the second prong of *Boyle*. Specifically, as discussed below, documentary evidence shows that 3M provided certain lots of its MilSpec-qualified FC-206 LightWater to the DoD that deviated from the formula originally qualified from 1974 through 1978. As such, it cannot be said that 3M's AFFF conformed at all times to MIL-F-24385's specifications.

3M's FC-206 LightWater was first qualified for placement on the QPL on May 9, 1974.[157] Later that year, 3M unilaterally changed the formula of FC-206 to reduce the production cost "because … of escalating raw material costs."[158]

[redacted]

[157] *See* Regina Dep. Ex. DL510, attached to London Decl. as Ex. 162.

[158] *See* 3M_BELL02724721, attached to London Decl. as Ex. 163, at 3M_BELL02724733.

[redacted]).[159]

[redacted].[160] [redacted]

[redacted].[161] (emphasis added).

[redacted].[162]

In light of the foregoing evidence, it cannot be said that no issues of fact exist as to whether 3M's LightWater products conformed to the MilSpec at least with respect to this specific timeframe.

[159] *See* FF_NAVY17_00002012, attached to London Decl. as Ex. 164, at FF_NAVY17_00002088.

[160] *See* Navy06-00001710, attached to London Decl. as Ex. 165, at Navy06-00001712.

[161] *See* Navy06-00001714, attached to London Decl. as Ex. 166, at Navy06-00001716.

[162] *See* FF_NAVY17_00002012, Ex. 164, at FF_NAVY_00002071.

B. Issues of Fact Exist as to Whether 3M Warned the Government of Dangers in the Use of C8-Containing AFFF that were Known to 3M but Not to the Government, Precluding Summary Judgment as to *Boyle* Prong Three.

Outside of this courtroom, 3M claims that its C8-containing AFFF products present no risk to human health.[163] But here, within the confines of litigation, 3M says something very different, arguing that the government elected to continue using C8-containing AFFF products with full knowledge of its life-altering health risks, including increased risks of cancer and birth defects, among other things. 3M's briefing ignores this obvious conflict as well as testimony and other evidence from DoD and EPA, which, as explained below, makes clear the government did not sanction the widespread use of 3M's C8-containing AFFF products with actual knowledge of these possible harms. Because it cannot refute this evidence, 3M points to a handful of small studies in the scientific literature and disclosures 3M made to governmental agencies in the 1980s. But this ignores that 3M manufactured and sold PFAS-containing products, including AFFF, and investigated them extensively, generating *hundreds* of studies and reports relating to their toxicology, pharmacology, epidemiology, teratology, carcinogenicity, fate, transport and human exposure.[164] These studies repeatedly identified and confirmed the human and environmental risks associated with its PFAS containing products – information that 3M initially chose not to timely disclose to EPA despite having a regulatory obligation to do so under TSCA.

The evidence cited by 3M as "proof" of the government's "actual knowledge" reveals that 3M actively chose not to disclose complete and accurate information to the government, and engaged in a campaign to stymie independent research into C8 and prevent public dissemination

[163] *See* 3M Website, https://www.3m.com/3M/en_US/pfas-stewardship-us/health-science/ ("The weight of scientific evidence from decades of research does not show that PFOS and PFOA causes harm in people at current or past levels.") (last visited June 17, 2022).

[164] *See, e.g.*, Pl. Ex. 49, Zobel Dep. Ex. BB226 (A 90-page index of studies performed by 3M during the 1970s, 80s and 90s, including pages of studies on PFOS and PFOA.)

of the risks associated with its products for as long as possible. This undeniably delayed the regulatory assessment and response to the threat posed by PFOS and PFOA. By the EPA's own admission, it did not even "begin an investigation of [PFOS and PFOA until] 2000"[165] after it "was prompted by reports submitted to the agency describing the toxic properties and widespread presence in the environment, including in human populations…"[166] Indeed, it was 3M who refrained from notifying the EPA until 1998 that its proprietary chemical, PFOS was widespread in the environment and present in the blood of virtually every man, woman and child.[167] In statements to the press and EPA, 3M claimed they were only able to make this discovery due to recent advancements in analytical techniques, and further claimed that the discovery of PFOS in the blood of the general population was "a complete surprise."[168] Contrary to this carefully crafted narrative, the truth was that 3M possessed this knowledge for more than *20 years*, [169] and had spent two decades actively hiding, distracting, or misleading those outside of 3M about this important public health matter.

1. After Learning from Guy and Taves that PFAS Had Been Found in Human Blood, 3M Hampered Their Research Efforts in Order to Minimize Any Connection to 3M

In the summer of 1975, 3M learned from two independent scientists that chemicals from 3M's C8-containing AFFF products had been found in human blood in five different U.S. cities. Specifically, Dr. Warren Guy, a toxicologist and professor at the University of Florida, called 3M's

[165] *See* 066-0133-0102913, attached to London Decl. as Ex. 167, at 066-0133-0102914.

[166] *See* Pl. Ex. 51 at 3M_AFFF_MDL01669634.

[167] *See* Pl. Ex. 50, Gerber Dep. Ex. DL353.

[168] *See* Pl. Ex. 52, Olsen Dep. Ex. LP193, at 3.

[169] A draft manuscript detailing the alleged "recent analytical technique" was produced by 3M with a hand-written post-it-note attached that read "now that the 'lid is off' [the paper's author] would like to get this paper out. Any problems?" *See* Kiester Dep. Ex. DL354, attached to London Decl. as Ex. 168, at 3M_BELL01945370.

corporate headquarters that summer concerning research he and Dr. Donald Taves, a toxicologist and professor at the University of Rochester, were going to present at a symposium organized by the American Chemical Society ("ACS"). Drs. Guy and Taves had discovered the presence of an unidentified organic fluorine chemical compound in human blood obtained from blood banks in those five cities. According to an internal 3M memorandum documenting these phone calls, Dr. Guy called 3M to see if it knew of the "possible sources" as Dr. Guy correctly "got the information that 3M's fluorocarbon carboxylic acids are used as surfactants and wanted to know if they were present in 'Scotchgard' or other items in general use by the public."[170] In another phone call, Dr. Taves specifically asked 3M if the "fluorochemical they have found in human blood is either a derivative of a perfluorocarboxylic acid or a perfluorosulphonic acid," and whether "the fluorochemical found in the blood might be coming from [3M's] paper or paperboard" products.[171] Rather than inform these scientists that 3M did manufacturer such products, including 3M's AFFF LightWater, 3M incredulously chose to "plead ignorance" and instead "adopted a position of scientific curiosity and desire to assist in any way possible..." when, in reality, 3M knew its AFFF product could be the source.[172]

Ultimately, Drs. Guy and Taves presented their research at an ACS symposium in Chicago on August 26, 1975, and documented their findings in a manuscript that concluded "the fluorine containing part of the compounds in the isolate (from human plasma) resemble perfluorooctanoic acid ("PFOA")."[173] The manuscript further posited: "These findings suggest that there is widespread contamination of human tissues with trace amounts of organic fluorocompounds

[170] *See* Pl. Ex. 53, Gerber Dep. Ex. DL11, at 3M_AFFF_MDL00419718-719.

[171] *See* Pl. Ex. 55, Gerber Dep. Ex. BB424, at 3M_BELL00054741.

[172] *See* Pl. Ex. 53, Gerber Dep. Ex. DL11, at 3M_AFFF_MDL00419719.

[173] *See* Olsen Dep. Ex. LP233, attached to London Decl. as Ex. 169, at 3MA00257430.

derived from commercial products. All available information on this subject is in accordance with this interpretation."[174]

Despite these early findings from Drs. Guy and Taves, 3M claims that the technology to observe PFOS in the blood of the general population "simply did not exist before the late 1990s and early 2000s."[175] Not so. In fact, in response to the manuscript authored by Drs. Guy and Taves, 3M's Commercial Chemicals Division Laboratory submitted samples of ten different "perfluorocarboxylic and perfluorosulfonic acid derivatives [made by 3M] to Central Research Analytical for 19F NMR analysis in an attempt to identify the material found by Guy and Taves in human blood."[176] On November 6, 1975, 3M scientist Richard Newmark, of the Central Analytical Laboratory ("CAL"), authored a report which compared the ten chemical compounds made by 3M to the chemical discovered by Drs. Guy and Taves.[177] Dr. Newmark concluded that the chemical spectrum presented by Drs. Guy and Taves "resembled most closely" PFOS, the PFAS compound manufactured exclusively by 3M, not PFOA.[178] Other internal 3M documents from the 1970s confirm the finding of PFOS in the blood of humans.[179]

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[174] *See id.*

[175] 3M Mot. at 16.

[176] *See* Pl. Ex. 56, Gerber Dep. Ex. DL8, at 3M_BELL00054589.

[177] *See* Pl. Ex. 57, Gerber Dep. Ex. DL9.

[178] *See id.*

[179] *See, e.g.,* Gerber Dep. Ex. DL1425, attached to London Decl. as Ex. 170, at 3M_AFFF_MDL00118637 [redacted]); Pl. Ex. 36, Butenhoff Dep. Ex. DL13, at 3M_AFFF_MDL00080700 ("1975 Taves presents 19F NMR spectra data to 3M – CRL **identifies 19F NMR spectrum as [PFOS]** or its salts"); Gerber Dep. Ex. DL1389, attached to London Decl. as Ex. 171, at 3M_AFFF_MDL00631450 [redacted]); Gerber Dep. Ex. DL1356, attached to London Decl. as Ex. 172, at 3M_AFFF_MDL02174988 [redacted]"); Gerber Dep. Ex. DL349, attached to London Decl. as Ex. 173, at 3MA00967518 ("You will recall that **past samples of Red Cross plasma have analyzed to contain a trace level of [PFOS]**…"); *see also* Expert Report of Plaintiffs' Expert Jonathan W. Martin, Ph.D., dated Mar. 18, 2022, attached to London Decl. as Ex. 174, at 4-19

Even though 3M had internally concluded that it was the likely source of the PFAS contamination identified by Drs. Guy and Taves, 3M decided to withhold this critical piece of information from Drs. Guy and Taves, the scientific community, and the government, noting in an internal timeline that, "[a]ccording to Richard Newmark, 3M lawyers urge CAL not to release the true identity (PFOS) of the [organic fluorine] compound."[180]

In 1976, Drs. Guy and Taves published their findings (without the critical information known to 3M but not shared by 3M that the organic fluorine was PFOS). Incredibly, 3M claims this publication provided the government sufficient information to link the contaminated blood found by Drs. Guy and Taves to 3M's manufacture of PFOS and PFOA. Putting aside 3M's decision not to share this information on its own, 3M can point to no evidence that the government (or anyone outside of 3M) could interpret this publication to mean that PFOS was present in the blood of the general population. For instance, the publication makes *no* reference to PFOS—a fact readily acknowledged by 3M's corporate representative.[181] In addition, the evidence shows that 3M took steps to undermine the findings of Drs. Guy and Taves by publishing that the substance they identified was a naturally occurring compound and not a manmade substance like those manufactured by 3M.[182] Indeed, 3M's efforts to stymie the scientific community's understanding of this issue worked as demonstrated by EPA's own admission that it was unaware of PFOA and PFOS in the blood of the general population until 3M's disclosure in 1998.[183]

[redacted]

[180] *See* Pl. Ex. 20, Gerber Dep. Ex. LP68.

[181] *See* Pl. Ex. 58, Gerber Dep. Tr., at 55:2-14; *see also* Olsen Dep. Ex. LP233, Ex. 169.

[182] *See* Pl. Ex. 59, Olsen Dep. Ex. DL884, at 1510.

[183] *See* Pl. Ex. 51 at 3M_AFFF_MDL01669634 (EPA letter stating that it did not begin assessing PFAS until learning widespread in human blood).

2. 3M Gained Additional Knowledge Regarding the Dangers Associated with C8-Containing AFFF in the 1970s, Which 3M Failed to Disclose to the Government

Following Drs. Guy and Taves' finding of PFOS in the blood of the general population, 3M began a slew of toxicology studies conducted on rats, mice and monkeys.[184] These studies, which began in the mid 1970's, confirmed that 3M's products could metabolize PFOS in the blood[185] and reported that "[PFOS] was the most toxic of the three compounds studied and certainly more toxic than anticipated."[186] The 90-day monkey study, for example, reported "GI tract toxicity, lipid depletion of adrenals, atrophy of pancreatic exocrine cells and serous alveolar cells of the salivary glands."[187] In total, 20 of the 28 rhesus monkeys in the study died as a result of their exposure to PFOS.[188]

Contemporaneous to 3M's toxicity testing on PFOS, 3M also learned that their PFAS products exhibited extraordinarily long half lives in humans – in other words that they were bioaccumulative. For example, an internal 3M timeline indicates that in June of 1976 that "results from previously exposed laboratory personnel indicate that organically based fluorine remains in the blood for an *indefinite* period."[189] [redacted] [redacted] [redacted]"[190] [redacted]

[184] *See* Pl. Ex. 36, Butenhoff Dep. Ex. DL13, at 3M_AFFF_MDL00080700.

[185] *See* Pl. Ex. 56, Gerber Dep. Ex. DL8. The study author told his colleagues that this was a "significant finding," and concluded that "the public health issue [is] simply one of frequency and type of exposure to 3M products." *See* Gerber Dep. Ex. LP203, attached to London Decl. as Ex. 175, at 3MA10035580.

[186] *See* Pl. Ex. 126, Gerber Dep. Ex. DL1353, at 3M_AFFF_MDL02174949.

[187] *See* Pl. Ex. 36, Butenhoff Dep. Ex. DL13, at 3M_AFFF_MDL0080705.

[188] *See id*. at 3M_AFFF_MDL0080704-05.

[189] *See* Pl. Ex. 56, Gerber Dep. Ex. DL8, at 3M_BELL00054590.

[190] *See* Gerber Dep. Ex. DL1391, attached to London Decl. as Ex. 176, at 3M_AFFF_MDL01789405.

[redacted]

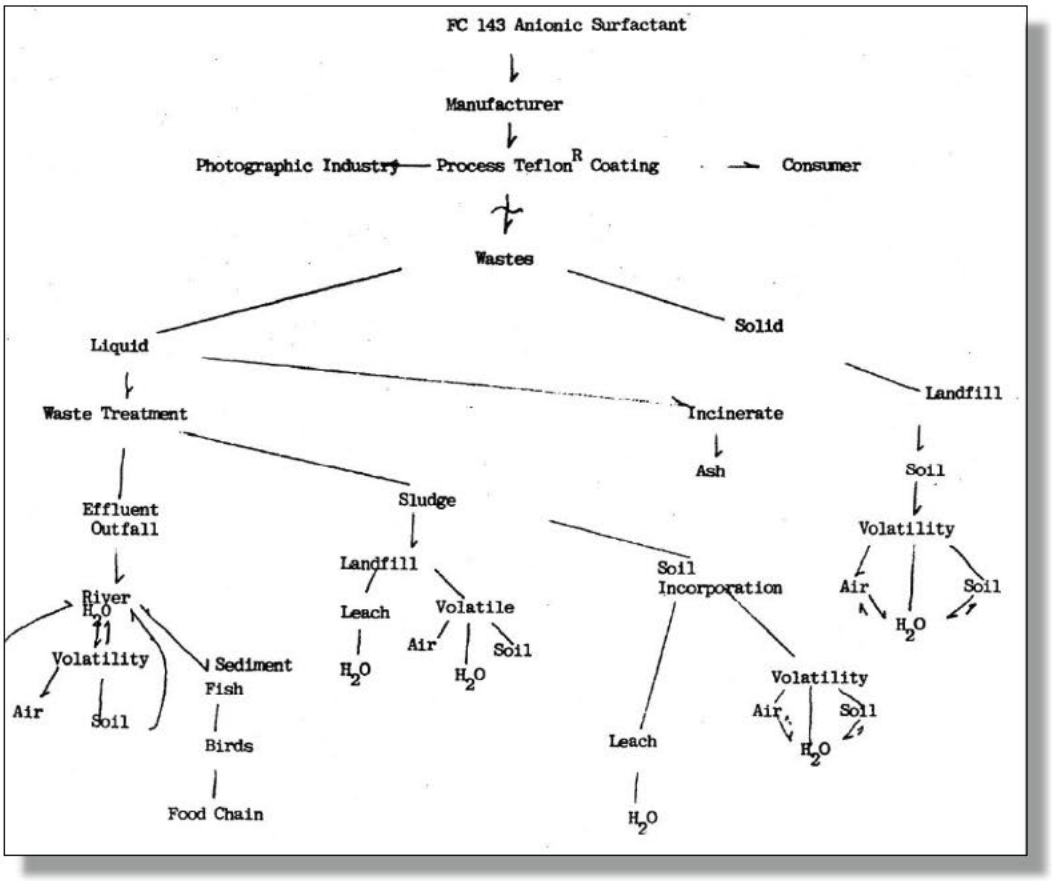
[redacted].”[191]

Likewise, a pair of March 1979 Clinical Report Summary indicates that 3M also investigated the fate and transport characteristics of its PFAS to determine how they could have infiltrated the bodies of literally every American. These studies found that these PFAS products were “water soluble,” “resistant to microbial degradation,” “highly mobile” in soil, and that “it appears that waterways are the environmental sink,” and therefore concluded that PFOS “has a potential for widespread distribution in the environment.”[192] The report included the below schematic illustrating how PFAS waste would be expected to end up in drinking water sources around the country.[193]

[191] *See* 3M_GU00030075, attached to London Decl. as Ex. 177, at 3M_GU00030088.

[192] *See* Mader Dep. Ex. DL22, attached to London Decl. as Ex. 178, at 3M_BELL01639316-23.

[193] *See* Mader Dep. Ex. DL23, attached to London Decl. as Ex. 179, at 3M_BELL01947256.



Likewise, 3M acknowledged in the 1970s that if they had warned users to incinerate PFAS waste or dispose of it in a lined landfill, it would prevent PFAS from getting into the nation's water systems.[194]

Faced with all of this information, 3M made the deliberate decision not to immediately report to the EPA that its proprietary AFFF chemical was toxic, bioaccumulative, capable to widespread environmental contamination and was present in the blood of the general

[194] *See* Dep. Tr. of 3M Fed. R. Civ. 30(b)(6) witness Brian Mader, dated Feb. 26, 2021, attached to London Decl. as Ex. 180, at 175:6-14; *see also id*. at 176:3-14.

population[195] despite being advised by EPA that "when in doubt: report"[196] – a decision made at the highest levels within 3M.[197]

3. The Information 3M Provided to the Government Failed to Accurately and Adequately Disclose the Risks Associated with 3M's AFFF Products

3M maintains that "in the 1980s, [it] shared worker health and animal toxicology studies with the government and the public" and that "3M repeatedly disclosed such information to EPA and other government agencies in the 1980s."[198] But a closer inspection of its disclosures reveals them to be incomplete, accompanied by assurances of no potential harm and followed by contradictory information.

For example, 3M directs the Court to a worker study by 3M's Dr. F. A. Ubel and a rat teratology (birth defect) study that was disclosed to the EPA in November 1980.[199] Both studies

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[195] *See* Pl. Ex. 58, Gerber Dep. Tr., at 90:23-91:25.

> Q: True or false: By 1980, 3M was in possession of information that PFOS was a bioaccumulative compound, that it was widespread in the blood of the general population, and that it killed rhesus monkeys that were exposed to it. […]
>
> A: Based on my review of the documents, **3M had all of** – **had those pieces of information** […] but […] all of that information needs to be put together and judgment applied to making a TSCA 8I reporting decision.
>
> Q: Right. And 3M did that. 3M had all of that information and **decided not to disclose** it at that time in 1980, right?
>
> A: **Yes**. I've reviewed documents that – you know, after the – those studies were conducted, that information was reviewed against EPA's reporting criteria, and the company made the determination that the information was not substantial risk information under TSCI(e).

[196] *See* Gerber Dep. Ex. DL1552, attached to London Decl. as Ex. 181, at 3M_AFFF_MDL02315927.

[197] *See* Gerber Dep. Ex. DL1553, attached to London Decl. as Ex. 182; 3M_AFFF_MDL02342766, attached to London Decl. as Ex. 183.

[198] 3M Mot. at 12.

[199] 3M Mot. at 12-13.

were submitted to EPA via a TSCA 8(e) disclosure[200] that contained numerous false statements as well as omitting additional key information. Specifically, the cover letter states that 3M only made 16,000 pounds of PFOS a year and that less than 100 people were expected to be exposed.[201] The letter makes no mention of the fact that 3M was manufacturing *millions* of pounds of PFOS precursors[202] or that at this point 3M had verified that virtually every American had been exposed to PFOS and had the chemical in their blood. Additionally, the letter to EPA included statements assuring the EPA that this chemical was safe – citing the Ubel study, stating "our employee records and the epidemiology data described in the aforementioned publication indicate that to date no human health problems have been observed nor disease patterns detected which are attributable or related to fluorochemical exposure."[203] However, what 3M neglected to tell the EPA [redacted]:

[redacted].[204]

With respect to the findings of the teratology study in rats – 3M retracted it, writing to the EPA that "we now know that the lens change is an artifact produced during our preparation of the histological sections. In no way was it compound produced or related."[205] As such, these

[200] Pursuant to Toxic Substances Control Act ("TSCA") § 8(e), 3M has been required to "immediately inform" the EPA of "information which reasonably supports the conclusion that such substance or mixture presents a substantial risk of injury to health or the environment." *See* Gerber Dep. Ex. DL1374, attached to London Decl. as Ex. 184, at 3M_AFFF_MDL00410830. A "substantial risk" is defined as "any non-trivial adverse effect, heretofore unknown to the administrator, associated with a chemical known to have *bioaccumulated* to a pronounced degree or to be *widespread in the environment*." *Id.* (emphasis added).

[201] *See* 3M_BELL00833248, attached to London Decl. as Ex. 187, at 3M_BELL00833249.

[202] *See* Olsen Dep. Ex. DL1221, attached to London Decl. as Ex. 186.

[203] *See* 3M_BELL00833248, Ex. 187, at 3M_BELL00833248-49.

[204] *See* Gerber Dep. Ex. DL1407, attached to London Decl. as Ex. 188, at 3M_BELL01741858.

[205] *See* 3M_AFFF_MDL00418033, attached to London Decl. as Ex. 189.

"disclosures" to EPA were hardly designed to raise alarm or concern with the agency, rather they conveyed the exact *opposite* message.

3M again misled the Government in March 1982. There, the TSCA Interagency Testing Committee[206] ("ITC") requested information from 3M pertaining to the PFOS precursor POSF. The ITC sought to conduct an "in depth review" so as to "determine whether or not the chemical warrants designation by the EPA Administrator for priority consideration for health and environmental effects testing."[207] The ITC directed 3M to the Federal Register for "the kinds of information that would be most helpful [to the ITC] in assessing" the chemical.[208] The Federal Register identified evidence of human exposure, including specifically "non-occupational exposure" as the type of information it was seeking.[209] Rather than inform the ITC that 3M was aware[210] that a metabolite of POSF (and thus evidence of exposure to POSF-based products[211]) was known to be present in the blood of the general population, 3M instead claimed that only

[206] The ITC is made up of the Council on Environmental Quality, Department of Commerce, Environmental Protection Agency, National Cancer Institute, National Institute of Environmental Health Sciences, National Institute for Occupational Safety and Health, National Science Foundation, Occupational Safety and Health Administration, Consumer Product Safety Commission, Department of Agriculture, Department of Defense, Department of the Interior, Food and Drug Administration and ATSDR. https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/interagency-testing-committee (last visited June 17, 2022).

[207] *See* Gerber Dep. Ex. DL1228, attached to London Decl. as Ex. 190.

[208] *See id*.

[209] *See* Gerber Dep. Ex. DL1554, attached to London Decl. as Ex. 191; Olsen Dep. Ex. DL1233, attached to London Decl. as Ex. 192, at 8244-8246.

[210] *See* Pl. Ex. 58, Gerber Dep. Tr., at 328:2-9:

> Q: Okay. So again, just to recap, at this point in time in 1982, 3M had been provided information suggesting that a metabolite of POSF was present in the blood of the general population, right?
>
> A: Information suggesting that from the Guy and Taves articles and 3M's blood bank analysis.

[211] *See* Dep. Tr. of 3M epidemiologist Geary Olsen (Vol. I), dated Apr. 8, 2021, attached to London Decl. as Ex. 193, at 42:15-43:4 (agreeing that PFOS in human blood is evidence of exposure to POSF).

"100 employees are potentially exposed to [POSF] on a regular basis" and that "an additional 30 employees are potentially exposed less than five days a year" – drastically misrepresenting the true scope of human exposure.[212] This submission to the ITC similarly misrepresented what 3M knew about the POSF/PFOS stating that "no information found" with respect to the metabolism of POSF, even though 3M possessed study results indicating POSF products metabolize to PFOS; stating that "no information was found" with respect to environmental concentrations even though 3M knew that the United States general population has approximately 30 ppb of PFOS in their blood; and that with respect to its potential to bioaccumulate that "POSF will not bioaccumulate to any appreciable extent" even though 3M possessed studies indicating that the POSF metabolite, PFOS does indeed bioaccumulate.[213] Unsurprisingly, the ITC did not require 3M to conduct any additional studies for its consideration at that time.

3M similarly downplayed to DoD the environmental and human health risks associated with AFFF. For example, 3M represented to DoD that "data available from standard toxicity tests" indicate that AFFF was "relatively innocuous."[214] In 1974, 3M told NRL that its AFFF was biodegradable and presented no adverse effects on the environment.[215] 3M even went so far as to advertise its AFFF as "biodegradable, low in toxicity, and it can be treated in biological treatment systems."[216] Eric Reiner, 3M's Environmental Specialist, repeatedly downplayed concerns about the use of AFFF through the 1980s. In response to concern about potential groundwater contamination from the use of AFFF at Mather Air Force Base, Reiner claimed that 3M's AFFF

[212] *See* Gerber Dep. Ex. DL1230, attached to London Decl. as Ex. 194, at 3M_AFFF_MDL00460300-301.

[213] *See* Gerber Dep. Ex. DL1428, attached to London Decl. as Ex. 195, at 4.

[214] *See* Pl. Ex. 98, Darwin Dep. Ex. DL53, at Navy02-00007167.

[215] *See* Pl. Ex. 99 at Navy02_00007025.

[216] *See* Pl. Ex. 100 at 3M_BELL03194250; Pl. Ex. 101 at 3M_BELL02617425.

"is practically nontoxic," and stated that "we do not expect that hazardous levels of groundwater contamination are likely to result from your usage of the 3M product."[217] Reiner also asserted that water that does not foam when shaken has low or no AFFF and is even drinkable.[218] Thus conveying the dangerously misleading notion that so long as your drinking water does not foam when shaken, it is safe to consume. Mr. Reiner provided a similar response to George Hess at EPA, calling 3M's AFFF "considerably less toxic than jet fuel."[219] Suggesting spilled jet fuel from a fire is somehow worse than the AFFF agent used to douse the fire, when 3M was well aware that PFOS was mobile in soil, toxic to animals, in the blood of virtually every American, and already knew the pathways by which PFOS would get into nation's drinking water, is grossly misleading and likely intended to convey a false sense of security.

In 1988, even Mr. Reiner began to express his concerns over the companies' misrepresentations to the department of Navy, and others, stating in an internal memo that "I don't think it is in 3M's long-term interest to perpetuate the myth that these fluorochemical surfactants are biodegradable. It is probable that this misconception will eventually be discovered, and when that happens, 3M will likely be embarrassed, and we and our customers may be fined and forced to immediately withdraw from the market." [220] Prophetically, Mr. Reiner was correct as both predictions came true. 3M withdrew from the market in 2000, and in 2006, 3M was fined by the EPA for failing to disclose "substantial risk information" in regards to both PFOA and PFOS.[221] 3M's misrepresentations of safety continued through the 1990s. The company's 1993

[217] *See* Pl. Ex. 102, Walker Dep. Ex. BB816, at 3M_BELL01440788 (Mar. 15, 1983).

[218] *See id*.

[219] *See* Pl. Ex. 103 (Aug. 16, 1983).

[220] *See* Butenhoff Dep. Ex. DL61, attached to London Decl. as Ex. 196, at 3M_BELL00050768.

[221] *See* 060-0036-0000321, Ex. 159, at 060-0036-0000324.

Product Toxicity Summary Sheet for FC-203CF Light Water Brand AFFF claims that following animal studies, the company concluded that FC-203CF is considered practically non-toxic orally and dermally and only "moderately irritating" to the eyes under the conditions of this study.[222] [redacted].[223] In 1998, 3M's head toxicologist, Dr. Butenhoff, calculated an "estimation of 'safe' reference level (ppb) of PFOS" in blood at 1.05 ppb.[224] This calculation led to the conclusion that PFOS was "very persistent" and thus "*insidiously toxic*," as per a confidential 1998 memorandum from Dr. Butenhoff's custodial file.[225] Rather than share Dr. Butenhoff's opinion and safe dose reference with the government, 3M told the EPA that it "does not believe that any reasonable basis exists to conclude that PFOS 'presents a substantial risk of injury to health or the environment.'"[226] Plaintiffs have found zero evidence that this safe reference dose was shared with the EPA, nor the fact that 99% of Americans were estimated to have PFOS blood levels in excess of the level determined to be "safe" by 3M around the time that calculation was conducted.[227] Clearly, this safe dose assessment represents another example of material safety information that 3M possessed and failed to disclose.

3M continued to downplay the risks in using of AFFF until at least 2000, telling customers that AFFF "does not pose a risk to people" and that AFFF "are safe to use."[228] In its letter to

[222] *See* Pl. Ex. 104.

[223] *See* Pl. Ex. 105, Santoro Dep. Ex. DL65, at 3M_AFFF_MDL00384561 ([redacted]).

[224] *See* Butenhoff Dep. Ex. DL157, attached to London Decl. as Ex. 197.

[225] *See* Butenhoff Dep. Ex. DL1, Ex. 140.

[226] *See* Pl. Ex. 50, Gerber Dep. Ex. DL353, at 3M_BELL02796621.

[227] See Mader Dep. Ex. LP200, attached to the London Decl. as Ex. 198, at 3M_BELL01333307, 310, and 322-23.

[228] *See* Schuster Dep. Ex. LP841, Ex. 139.

AFFF customers, 3M went so far as to specifically state "[u]se of these products does not pose a risk to people," and "will remain effective for years," and that "there's no reason to return any of these products you may have un your inventory."[229] These statements are particularly egregious in light of the fact that by 1997, internal 3M material safety data sheets for PFOA (which was present in 3M's LightWater as an impurity and used in LightWater formulations in the 1960s), explicitly warned that PFOA was "a chemical which can cause cancer," citing two animal studies where rats exposed to PFOA developed various tumors, including Leydig cell tumors in one study and a triad of tumor types in a second study, which formed the basis for the cancer warning.[230] Notably, the cancer warning in the 1997 MSDS for PFOA in subsequent years is conspicuously omitted.

Finally, 3M's pattern of inaccurate and incomplete disclosures to the government materially impacted the actions the government took with respect to PFOS and PFOA containing products. When 3M finally disclosed to EPA in 1998 that 3M's C8-containing AFFF products were found in human blood – a disclosure that 3M admitted could have occurred in 1980 – EPA took action, noting it "was prompted by reports submitted to the agency describing the toxic properties and widespread presence in the environment, including in human populations…"[231] In 2006, EPA fined 3M for its "failures to notify EPA on new chemicals, and late reporting on substantial risk information" as to PFOA and PFOS.[232] Thus, there can be no question that the

[229] *See id*.

[230] *See* Hakes Dep. Ex. DL36, attached to London Decl. as Ex. 199, at 3M_MN05419464.

[231] *See* Pl. Ex. 51 at 3M_AFFF_MDL01669634.

[232] *See* 066-0133-0102913, Ex. 167. It is notable that Dupont was fined by the EPA for failing to disclose data it possessed pertaining to PFOA blood levels of the general population, leading EPA to state that "the human serum sampling data are particularly useful because they represent an attempt to associate body burden in the general population with a specific exposure pathway and a source of exposure. This data is information that reasonably supports the conclusion that PFOA presents a substantial risk of injury to human health…" *In re E. I. Du Pont de*

government's actual knowledge did not match that of 3M's because 3M withheld substantial risk information as evidenced by this fine.

The complete lack of candor on 3M's part is incompatible and totally at odds with the underlying the purpose of the government contractor defense as espoused in *Boyle.* Far from allowing the government to employ its discretion to use 3M's AFFF with full, complete and accurate knowledge of the product, 3M shanghaied the government and abused its privileges. Under these circumstances, the *Boyle* standards have not been satisfied.

4. 3M Ignores Evidence Showing that the Government Did Not Know of the Hazards Posed by 3M's AFFF

The picture 3M paints of the government's actual knowledge relies exclusively on scientific articles and regulatory disclosures 3M made decades ago, disregarding the actual testimony from the government. Specifically, DoD witnesses testified that they did not possess actual knowledge of any of the information contained in 3M's disclosures. For instance, Mr. Darwin testified that he did not know that PFOS was a fluorosurfactant in 3M's AFFF until *after* 2000, and, prior to that time, did not have the "slightest idea" what PFOA and PFOS even were.[233] Similarly, Mr. Farley, testified that prior to 2000, he had never heard of PFOS.[234] This evidence , in and of itself, is more than sufficient to raise a question of fact as to whether the government possessed actual knowledge of the environmental and health hazards associated with 3M's AFFF products.

Nemours & Co., Docket No. TSCA-HQ-2005-5001 (Compl. & Notice of Opportunity for Hr'g), dated Dec. 6, 2004, attached to London Decl. as Ex. 200, at 7.

[233] *See* Pl. Ex. 2, Darwin Dep. Tr. Vol. I, at 46:23-47:2 (testifying that prior to 2000, he did not know that PFOS was a fluorosurfactant in 3M's AFFF and did not have the "slightest idea" what PFOA and PFOS were) and 109:6-21 (testifying that he had never heard of PFOS or PFOA until sometime in the 2000s after he left the Navy.)

[234] *See* Pl. Ex. 35, Farley Dep. Tr. Vol. I, at 89:15-24 (confirming he learned that PFOS was in 3M's MilSpec AFFF in approx. May 2000).

In light of the above, it is clear that there are numerous instances where 3M's internal knowledge regarding the dangers associated with C8-containing AFFFs was far superior to that of government. In most cases, this was knowledge that 3M failed to disclose fully and transparently to government. These failures to be transparent with the government diminished its understanding of the dangers posed by C8-containing AFFFs. As a result of these failures, the government lacked actual knowledge concerning dangers posed by C8-containing AFFF, which is relevant to the government's continued use of these AFFFs under prong one of *Boyle* as well as to *Boyle* prong three insofar as it evidences a failure of 3M to warn of dangers known to it but unknown to government. Finally, the record substantiates that had 3M been transparent with government concerning the dangers posed by C8-containing AFFFs, then government's decision making with respect to C8-containing AFFFs would have been different.

V. ARGUMENT IN OPPOSITION TO THE MOTION OF THE TELOMER DEFENDANTS

The Telomer Defendants have failed to carry their burden of proof with respect to the second and third prongs of *Boyle* that no genuine issues of fact exist, and thus are not entitled to the Government Contractor Defense.

A. Issues of Fact Exist as to Whether Telomer-Based AFFF Products Conformed to MIL-F-24385 at All Relevant Times, Precluding Summary Judgment as to the Second Prong of *Boyle*

The Telomer Defendants' argument for why they satisfy the second prong of *Boyle* is overly simple. They contend that the mere listing of their AFFFs on the QPL is proof that B*oyle* prong two has been satisfied. This reasoning is fundamentally flawed [redacted]

[redacted].[235]

In any event, the initial, one-time test of a product in the initial qualification process for QPL-listing is not sufficient, much less "conclusive"[236] evidence, that the product at all relevant times met the MilSpec requirements. In fact, at certain times, [redacted].[237] [redacted]. Accordingly, the Telomer Defendants cannot meet the second prong of *Boyle* as a matter of law, contrary to their unsupported statement.[238]

The Telomer Defendants argue that "QPL listing is conclusive evidence of conformance to the government's specifications, and every QPL-listed MilSpec AFFF product satisfies the second element of the GCD."[239] However, the mere fact of attaining QPL status, after one initial test and in the absence of continual testing over time, cannot stand as conclusive evidence of

[235] It is also important to note that one AFFF product sold by the Kidde Defendants and National Foam, Inc., namely, Universal Gold, which was widely used at locations relevant to all three bellwethers, was never on the QPL as it is not MilSpec grade AFFF, and, therefore, with respect to Universal Gold, those Defendants are clearly not entitled to the government contractor defense.

[236] *See* Telomer Defs.' Mem. at 9.

[237] *See* Farley Dep. Ex. DL1431, attached to London Decl. as Ex. 201 ([redacted].

[238] *See* Telomer Defs.' Mem. at 8.

[239] *See* Telomer Defs.' Mem. at 9.

meeting the second prong of *Boyle* for all relevant products at all relevant times. In short, it is innately illogical for a contractor to receive perpetual immunity from liability [redacted]. The Telomer Defendants' reliance on *Lewis* for their position is similarly misplaced. *Lewis* concerned a specific design defect in an aircraft approved by the government at a specific time period,[240] while, as previously discussed, [redacted]; therefore, a one-time inspection and approval in this case is not sufficient to satisfy the second prong of *Boyle*.

Importantly, Telomer Defendants' contentions are controverted by the government's own witnesses. [redacted].[241] [redacted].[242] [redacted]

[240] *Lewis*, 1992 WL 142751, at *1-7.

[241] *See* Farley Dep. Ex. DL1431, Ex. 201, at FF_NAVY08_00000223 ([redacted].

[242] *See id.* at FF_NAVY08_00000222.

[redacted].[243]

[redacted].[244] In other words, the watchdog was not always prowling, [redacted].

[243] *See* Pl. Ex. 35, Farley Dep. Tr. Vol. I, at 136:15-137:5, 139:12-140:17 (emphasis added) (objections removed).

[244] *See* FF_NAVY08_00011206, attached to London Decl. as Ex. 202, at FF_NAVY08_00011211.

[redacted]. [redacted]

[redacted].[245]

[redacted].”[246] [redacted]

[redacted].[247] [redacted]

[redacted]. The Telomer Defendants have failed to prove that there are no issues of fact regarding their compliance with the MilSpec and thus have failed to meet the second prong of *Boyle*.

[245] *See also*, § III.A, *supra*.

[246] *See* TMM Ex. 25 at FF_NAVY02_000001104.

[247] *See id*.

1. Issues of Fact Exist as to Whether Tyco/Ansul's AFFF conformed to the MilSpec Precluding Summary Judgment as to the Second Prong of *Boyle*.

Defendant Tyco/Ansul [redacted].[248] As noted above, [redacted].[249] [redacted].[250] [redacted].[251]

It is undisputed that Ansulite AFC-5 and Ansulite AFC-5A were capable of and did meet MilSpec in 1982 utilizing 95%+ C6 based fluorosurfactant, with the C8 component accounting for less than 1% of the total fluorosurfactant.[252, 253] The Navy, [redacted]

[248] *See* Telomer Defs.' Mem. at 11.

[249] *See* Farley Dep. Ex. DL1431, Ex. 201, at FF_NAVY08_00000222 ([redacted]) and 226 [redacted]).

[250] *See* AFFFTC00067539, attached to London Decl. as Ex. 203, at AFFFTC00067542 [redacted].

[251] *See id.* at AFFFTC00067543.

[252] *See* Dep. Tr. of Mitchell J. Hubert, a former chemist at Ansul, dated Mar. 16, 2021, attached to London Decl. as Ex. 204, at 69:7-15 ([redacted]); *see also* TMM Ex. 11, Decl. of Mitchell J. Hubert, ¶27 ([redacted]").

[253] *See* Fiedler Dep. Ex. DL1721, Ex. 152, at AGCCA-AFFF-00006907 [redacted]).

[redacted]."[254] Accordingly, at some point between 1982, when they were first qualified and last tested,[255] and 2014, [redacted][256] [redacted]. It should be noted that, [redacted]:

> [redacted].[257]
>
> [redacted]

[redacted].[258]

[254] *See* AFFFTC00067539, Ex. 203, at AFFFTC00067542.

[255] *See* Engman Dep. Ex. DL342, attached to London Decl. as Ex. 205, at 8 ([redacted]); *see also* FF_NAVY17_00004302, attached to London Decl. as Ex. 206, at FF_NAVY17_00004302 ([redacted]).

[256] *See* Farley Dep. Ex. DL1431, Ex. 201, at FF_NAVY08_00000226 ([redacted]).

[257] *See* AFFFTC00067539, Ex. 203, at AFFFTC00067539 (emphasis added).

[258] *See* Novac Dep. Ex. DL604, attached to London Decl. as Ex. 207, at AFFFTC00000107-108 ([redacted] Dep. Tr. of Philip J. Novac, former global director of foam systems at Tyco, dated Mar. 19, 2021 ("Novac Dep. Tr. Vol. II"), attached to London Decl. as Ex. 208, at 412:14-19:

> [redacted]
>
> [redacted].

[redacted].[259] As discussed above, [redacted], it simply cannot be said as a matter of law that they have satisfied the second prong of *Boyle*.

2. Issues of Fact Exist as to Whether Chemguard's AFFF conformed to the MilSpec Precluding Summary Judgment as to the Second Prong of *Boyle*.

[redacted].[260] Chemguard's representations otherwise are false. Specifically, [redacted].[261] [redacted].[262] Accordingly, [redacted]

[259] *See* Telomer Defs.' Mem. at 11; *see also* TMM Exs. 25, at FF_NAVY02_000001104, & 30, at FF_NAVY18_00005820.

[260] *See* Farley Dep. Ex. DL1431, Ex. 201, at FF_NAVY08_00000222 ([redacted]).

[261] *See* Novac Dep. Ex. DL1141, attached to London Decl. as Ex. 209, at AFFFTC00001562. [redacted]." *Id*. at AFFFTC00001563.

[262] *See id*. at AFFFTC00001562.

[redacted].[263]

Notably, [redacted]."[264] This action alone [redacted].[265] Thus issues of fact permeate the record regarding Chemguard's compliance with the MilSpec requirements [redacted].[266] Therefore, it cannot be found as a matter of law that Chemguard satisfies the second prong of *Boyle*.

As with Tyco/Ansul, [redacted] Contrary to Chemguard's unsupported statements, it cannot be determined as a matter of law

[263] *See id.* at AFFFTC00001562 [redacted]; at AFFFTC00001563 ([redacted] (emphasis added)

[264] *See* Novac Dep. Ex. DL1142, attached to London Decl. as Ex. 210, at AFFFTC00001529.

[265] *See id.* at AFFFTC00001528-29 ([redacted]. *See also* Novac Dep. Tr. Vol. II, Ex. 208, at 419:20-420:7 ([redacted]:

- [redacted]
- [redacted].

[266] *See* Novac Dep. Tr. Vol. II, Ex. 208, at 420:25-422:13 [redacted]).

that Chemguard's AFFF products conformed to the MilSpec, and it, therefore, cannot satisfy the second prong of *Boyle*.

3. Issues of Fact Exist as to Whether Buckeye's AFFF Conformed to the MilSpec Precluding Summary Judgment as to the Second Prong of *Boyle*.

[redacted].[267] Prior to 2004, Buckeye sold only one product as MilSpec qualified, *i.e.*, Buckeye 3% Mil Spec AFFF (BFC-3MS).[268] [redacted].[269] Notwithstanding Buckeye's representations, the Navy never recognized that this product had been certified to meet MilSpec.[270] Even Buckeye's Manager of

[267] *See* Dep. Tr. of William Vegso, Buckeye manager of research and development, dated Oct. 25, 2021, attached to London Decl. as Ex. 211, at 239:11-257:16 ([redacted]); 257:19-263:7 ([redacted]); 264:7-267:12 ([redacted]). *See also* Vegso Dep. Exs. DL1767, DL1768, and DL1777, attached to London Decl. as Exs. 212, 213, and 214, respectively.

[268] *See* Def. Buckeye Fire Equipment Company's Resps. to Pls.' First Set of Interrogs., dated Oct. 16, 2019, attached to London Decl. as Ex. 215, at 4, Resp. to Interrog. No. 2 [redacted] (emphasis added). *See also* Pl. Ex. 113, Dep. Tr. of James Devonshire, at 88:1-8 ([redacted]).

[269] *See* BF_00016553, attached to London Decl. as Ex. 216, at 1 ([redacted]; BF_00366082, attached to London Decl. as Ex. 217, at 1 ([redacted]; Pl. Ex. 118, Dep. Tr. of Eduard Kleiner, at 316:14-22 (testifying that DX2200 is 100 percent C8 based). *See also* Vegso Dep. Ex. DL1741, attached to London Decl. as Ex. 218, at BF_00144521 ([redacted]); Vegso Dep. Ex. DL1742, attached to London Decl. as Ex. 219, at BF_00334646 ([redacted]).

[270] *See* Vegso Dep. Ex. DL1777, Ex. 214, at Navy02-00002865 (2012 Navy email stating that, Buckeye's AFFF manufactured before 2004 [did] not meet MilSpec"); *see also* Regina Dep. Ex. DL511, attached to London Decl. as Ex. 220 (Buckeye not listed on Apr. 24, 2002 QPL superseding Oct. 30, 1998 QPL); Dep. Tr. of William Vegso, Ex. 211, at 25:14-17 ([redacted]).

Research and Development, William Vegso, [redacted].[271]

After 2004, Buckeye managed to formally attain QPL standing for BFC-3MS until 2015.[272] However, once Buckeye's C8 MilSpec AFFF was removed from the QPL in 2015, none of Buckeye's other products, including its reformulated C6 AFFF, were QPL certified until 2020.[273]

The veracity of Buckeye's C8 MilSpec AFFF conforming with the MilSpec itself is disputed. Since Buckeye's BFC-3MS conformance with MilSpec presents a question of fact in this case, summary judgment is not appropriate.

B. Issues of Fact Exist as to Whether the Telomer Defendants Warned the Government of Dangers in the Use of AFFF that were known to them but not to the Government Precluding Summary Judgment as to the Third Prong of *Boyle*.

The Telomer Defendants claim that the government was, at all relevant times, aware that Telomer-based AFFFs could degrade to PFOA in the environment, that PFOA was potentially hazardous to humans and the environment, and that the government's knowledge of these issues always exceeded that of the Telomer Defendants, and, therefore, as a matter of law, they have

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[271] *See* Dep. Tr. of William Vegso, Ex. 211, at 263:16-25 ([redacted]).

[272] *See* FF_FAA04_00116920, attached to London Decl. as Ex. 221, at FF_FAA04_00116921 (Buckeye 3% BFC-3MS AFFF on Jan. 2, 2004 QPL superseding Apr. 24, 2002 QPL); *see also* Dep. Tr. of William Vegso, Ex. 211, at 228:7-229:12 ([redacted]); 268:18-270:15 ([redacted]); Vegso Dep. Ex. DL1749 and DL1771, attached to London Decl. as Exs. 222 and 223, respectively; BF_00261686, attached to London Decl. as Ex. 224, and corresponding attachment BF_00261687, attached to London Decl. as Ex. 225 ([redacted]); Def. Ex. 99 at FF_NAVY16_00000002 (Buckeye 3% BFC-3MS AFFF on QPL from Jan. 2, 2004 until Sept. 22, 2015).

[273] *See* Dep. Tr. of William Vegso, Ex. 211, at 271:2-277:25 ([redacted]); Vegso Dep. Exs. DL1770 and DL1776, attached to London Decl. as Exs. 226 and 227, respectively; Def. Ex. 99 at FF_NAVY16_00000002 (Buckeye Platinum Plus C6 3% MS-AFFF on QPL as of Apr. 30, 2020).

satisfied *Boyle*'s third prong.[274] The evidentiary record supports the opposite conclusion. That is, that despite common industry knowledge that telomer-based AFFFs degrade to PFOA in the environment, both individually, and through the FFFC, the Telomer Defendants routinely represented to the government that their telomer-based AFFFs do not contain or degrade to PFOA. These misrepresentations, which the government accepted as accurate, rendered the government's knowledge related to C8-containing telomer-based AFFFs both incomplete and inaccurate. Further, both individually and through the FFFC, the Telomer Defendants deceived the government into the misconception that telomer-based C8-containing AFFFs were not associated with PFOA whatsoever, and, as a result of these misrepresentations, the government should not be concerned with PFOA in relation to AFFF.

The proof is borne out by United States witnesses' testimony that the government was unaware that telomer-based AFFFs could degrade to PFOA. Finally, as set forth below in § V.B.7, *infra*, through membership in the FFFC, the aggregate knowledge of the FFFC, as reflected in its documents and statements, can be imputed to each individual member of the FFFC given traditional agency principles that impute the agent's knowledge (i.e., the FFFC) to that of the principals (i.e., the individual members of the FFFC – which, historically, included each of the moving Defendants).

1. The Government Never Possessed Superior or Even Equal Knowledge to that of Industry Regarding the Degradation of C8-Containing Telomer-Based AFFFs to PFOA, or the Presence of PFOA in Telomer-Based AFFFs.

Contrary to the Telomer Defendants' arguments, the record makes patently clear that the government was not aware that C8-containing telomer based AFFFs degrade to PFOA. For

[274] *See* Telomer Defs.' Mem. at 15.

example, the testimony of United States witness, Curtis Bowling, who from 2001 until January 2013, served as the Assistant Deputy Undersecretary of Defense for Force Protection at the DoD,[275] proves that the government did not have actual knowledge of any degradation problem with the Telomer Defendants' products. When queried about a March 2001 email regarding his understanding of concerns related to telomers degrading to PFOA, Mr. Bowling testified as follows:

> Q: …In his e-mail he says, "I'll provide a draft emphasizing the dispersive nature of AFFF and our concerns based on the degradation of telomer surfactants to perfluorocarboxylic acids resembling PFOA." Do you see that?
>
> A: Yes.
>
> Q: What was your understanding of that at the time, that sentence?
>
> A: I have no idea. I don't recall the e-mail, so I don't know what my reaction would have been other than that it was strange to get a letter from a contractor working in a lab at an Air Force base out of chain of command asking me to do something.
>
> Q: Okay. What did you take him to mean by "our concerns based on the degradation of telomer surfactants to perfluorocarboxylic acids resembling PFOA?"
>
> A: Again, I don't remember the email, so I don't recall any reaction.
>
> Q: Okay. Do you have an understanding of what that means sitting here today?
>
> A: ***No***.[276]

Similarly, on this same point, Mr. Darwin, the original custodian of MIL-F-24385, testified to a lack of knowledge of the defect:

> Q: So it was your understanding even as of 2004, leaving aside the question of trace amounts, that your understanding was in 2004 that these other telomer makers like National Foam, like Buckeye…Chemguard, Tyco, that they did not use – that they did not utilize either PFOS, PFOA or PFOA precursors?

[275] *See* Bowling Dep. Ex. DCC700, Decl. of Curtis Bowling, dated Sept. 23, 2021, attached to London Decl., as Ex. 228, ¶ 1.

[276] *See* Pl. Ex. 106, Dep. Tr. of Curtis Bowling, at 115:12-116:18 (Objs. omitted) (emphasis added).

A: I believe that was the statement that Mary Dominiak [of EPA] made…

Q: Okay. In fact, that's a statement that these companies themselves made repeatedly, over and over again, right?

A: I believe that's true.

***

Q: Did you know, sir…many of the fluorosurfactants used in the 2000s that made it to the QPL did include PFOA precursors and other C8s?

A: …I mean, I remember being told that there were trace amounts of PFOA --

Q: Other than the trace amounts?

A: Other than the – other than the trace amounts? **No, I didn't know that**.[277]

Further, a 2004 email from Mr. Darwin substantiates his testimony wherein he states that "EPA has excluded the current US manufacturers of AFFF from the on-going EPA Enforceable Consent Agreement Process Regarding Chemicals Containing PFOAs due to recent acknowledgement from EPA that current AFFFs do not contain, nor do they degrade to, PFOAs."[278]

Finally, when Mr. Farley, the Director of Fire Test Operations at NRL, was questioned on this issue, he testified:

[redacted]

[redacted].[279]

[277] *See* Pl. Ex. 2, Darwin Dep. Tr. Vol. I, at 190:6-22 and 199:1-15 (Objs. omitted) (emphasis added).

[278] *See* Darwin Dep. Ex. DL1311, attached to London Decl. as Ex. 229. *See also* Hubert Dep. Ex. LP763, attached to London Decl. as Ex. 230 ([redacted]).

[279] *See* Pl. Ex. 35, Farley Dep. Tr. Vol. I, at 125:20-126:8 (emphasis added).

In other words, even today, Mr. Farley, the lead qualifier responsible for listing AFFFs on the QPL, is unaware that C8-containing AFFFs degrade to PFOA in the environment. In fact, Mr. Walker was under the distinct impression that the telomer-based AFFFs were "part of the solution set to the loss of 3M AFFF."[280] The totality of this testimony coupled with documentary evidence is impossible to square with the telomer AFFF manufacturers' claim that the government's actual knowledge that their AFFFs could transform to PFOA in the environment always exceeded theirs. Certainly, at a minimum, the above renders the question of government knowledge on this issue of PFOA degradation resulting from the use of C8-containing AFFFs a question of fact for the jury.

2. The Telomer Defendants Successfully Convinced the Government Their AFFF was Not a Source of PFOA in the Environment Despite Internal Knowledge that C8s Do Degrade to PFOA

The reason the government did not have actual knowledge of this phenomena, and undoubtedly had inferior knowledge to that of industry, is because the telomer AFFF manufacturers, both individually and through the FFFC, repeatedly withheld this information from the government, and actively misled the government into believing that telomer AFFFs do not degrade to PFOA, and, further, that their AFFFs were not associated with PFOA whatsoever. The record proves that the telomer-based AFFF industry was aware that EPA was concerned about the potential of telomer-based AFFFs to degrade to PFOA, and thus the telomer industry's very survival depended on EPA believing that their AFFFs did not degrade to PFOA, nor were they associated with PFOA.[281] Thus, the FFFC began a quest to convince the EPA that their AFFFs were not a source of PFOA in the environment.

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[280] *See* Pl. Ex. 70, Walker Dep. Tr. Vol. I, at 174:9-13.

[281] *See* AFFF-MDL-CHE-00005308, attached to London Decl. as Ex. 231 ([redacted]

Illustrative of this misinformation campaign is [redacted]

[redacted]

Clearly, this propaganda campaign successfully convinced the EPA that C8-containing telomer-based AFFFs were not a source of PFOA in the environment. Despite these misrepresentations to the government, internal industry documents make clear that common industry knowledge by as early as 2001, as discussed below, was that C8-containing AFFFs

[redacted]; *see also* FFFC001739, attached to London Decl. as Ex. 232, at FFFC001741 (stating that in 2001, the "[m]ain threat to AFFF was concern that telomers would break down into PFOA").

[282] *See* Regina Dep. Ex. DL517, Ex. 143, at AFFF_MDL_CHE_00000911.

[283] *See id.* at AFFF_MDL_CHE_00000912.

[284] As of Dec. 2002, Defendants Buckeye, Kidde, and Ansul were all board members of the FFFC. *See* FFFC website (displaying the company logos for FFFC Board Members), available at: https://www.fffc.org/_files/ugd/331cad_c749efa17c0f45be967c7fb027b3e03f.pdf (last visited June 17, 2022).

[285] *See* AFFF-MDL-EID-06608864, Ex. 148.

[286] *See* AFFF-MDL-CHE-00005308, Ex. 231.

degrade to PFOA in the environment. This common industry knowledge was not only withheld from the government, but the telomer-based AFFF manufacturers also each manipulated and actively deceived the government into thinking that PFOA was not a problem associated with telomer-based AFFFs.

3. At All Relevant Times Kidde and National Foam Never Warned the Government of the Dangers of C8-Containing AFFFs Degrading to PFOA that were known to them but not the Government.

Defendants Kidde and National Foam claim that, at all relevant times, the government's knowledge of the potential hazards of AFFF was either equal to, or exceeded that, of Defendants Kidde and National Foam, because they did not have actual knowledge that their MilSpec AFFF contained or degraded to PFOA until after the government.[287] This argument is without merit. First, although Kidde claims that it did not know until years after the government that its AFFF contained constituents that degrade into PFOA,[288] a 2001 email from then-Kidde employee, Anne Regina, the so-called "Queen of Foam," belies this argument. More specifically, in 2001, Ms. Regina wrote to her Kidde colleague, Frank Fitch, that she spoke with Chang who said that "the ***common understanding of telomer-based fluorosurfactants is that they break down to carboxylates***."[289] She went on to state "[m]ost of the telomer products would also have mixed distributions, so that rules out breaking down to only PFOA."[290] In her deposition, Ms. Regina explained that "Chang," refers to "Chang Jho,"[291] a current long-term employee of fluorosurfactant

[287] *See* Telomer Defs.' Mem. at 21.

[288] *Id.*

[289] *See* Regina Dep. Ex. DL461, Ex. 147 (emphasis added). While the Defendants may claim that this one email cannot serve as the basis of industry knowledge, this argument is baseless because it is far more than an email. This document describes a conversation between two high-level and highly-experienced chemists, at two different companies in the AFFF industry, wherein a third-highly respected scientist memorialized what was generally understood by industry at the time. Namely, that C8s degrade to PFOA.

[290] *See* Regina Dep. Ex. DL461, Ex. 147.

[291] *See* Pl. Ex. 109, Dep. Tr. of Anne Regina, at 160:15-17.

manufacturer Dynax Corporation ("Dynax"),[292] and former employee of Ciba-Geigy,[293] predecessor-in-interest to Defendant BASF Corporation. Clearly, as an expert in the field, Dr. Jho is providing Ms. Regina with not only his own understanding of the degradation pathway of telomer-based AFFFs, but with the then-current state of common industry knowledge in this regard.[294, 295, 296]

Similarly in 2001, another Kidde employee, David Spring, wrote to his Kidde colleague, John Dowling, that "our telomer fluorosurfactants will end up as a perfluoroalkyl carboxylic acid."[297] PFOA is a carboxylic acid.[298] Another email from 2002, written by Mr. Dowling, writing to multiple colleagues, including Ms. Regina, stated that "[a]s chemists (with knowledge of telomer structure and formulation) will be aware, PFOA (and the salts thereof) could eventually appear as degradation products within formulations which encompass telomer products."[299]

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[292] Dynax has been a member of the FFFC from its inception in 2001 through to present. *See* Hubert Dep. Ex. LP758, Ex. 145, at AFFF-MDL-CHE-00004465 ([redacted]); DYNAX0025104, attached to London Decl. as Ex. 233, at DYNAX0025106 ([redacted]); *see also* FFFC website (displaying FFFC member logos), available at: fffc.org (last visited June 17, 2022). As such, Dynax's knowledge as a principal of the FFFC can be imputed to those other Defendants who appointed the FFFC as its agent. *See* § V.B.7, *infra*.

[293] In 2001, Ciba-Geigy was part of the FFFC. *See* Hubert Dep. Ex. LP758, Ex. 145, at AFFF-MDL-CHE-00004465 ([redacted]).

[294] Dynax's website makes clear that Dr. Chang Jho is an expert in the fluorosurfactant field, joining Dynax in 2004 after having "had 26 years of experience in the research and development of specialty fluorochemicals, especially in their applications for the fire-fighting foam agents. Dr. Jho was Manager of the Technical Service and Development Laboratories of Ciba Specialty Chemicals, responsible for a team of chemists covering Ciba's world-wide fluorochemicals businesses for paper chemicals, fire-fighting and coatings and ink applications." *See* Dynax's website, available at: https://dynaxcorp.com/our-company/ (last visited June 17, 2022).

[295] This common industry understanding as of 2001 is now, in fact, today, the common understanding in the scientific community at large. *See* Expert Report of Defendants' Expert, Tiffany Thomas, PhD, dated Apr. 29, 2022, attached to London Decl. as Ex. 234, Summary of Opinions 8-12, at 5-6 [redacted] .

[296] Notably, Dr. Chang Jho was listed by the Defendants in their Fed. R. Civ. 26 expert witness disclosure, and, thus, presumably they too consider Dr. Jho an expert in the field.

[297] *See* Regina Dep. Ex. DL487, attached to London Decl. as Ex. 235, at Kidde_Defendants_00161901.

[298] *See* Pl. Ex. 109, Dep. Tr. of Anne Regina, at 118:23-119:1 ([redacted]).

[299] *See* Kidde_Defendants_00159076, attached to London Decl. as Ex. 236, at Kidde_Defendants_00159076.

Finally, a fourth email, likewise from Mr. Dowling in 2002, notes that "Kidde (and other 'Telomer' derived AFFFs) do not have PFOA added per se, BUT it is chemically feasible that PFOA could become present in small quantities as product becomes older or degraded."[300] In short, the evidence proves that by 2001, not only did Kidde have actual knowledge that its AFFFs contained constituents capable of degrading into PFOA, but also that this was common knowledge among industry. Any denial of this evidence merely confirms the presence of disputed issues of fact as to whether Defendant Kidde possessed actual knowledge that its telomer-based AFFFs degraded to PFOA as early as 2001. Further, when this internal industry knowledge is juxtaposed against the testimony of the government witnesses, who, in some cases, testified that even today they are unaware that C8-contaning telomer-based AFFFs can degrade to PFOA,[301] it becomes patently obvious that a genuine issue of fact exists regarding the comparative knowledge as between the government and Defendant Kidde insofar as degradation of telomer-based AFFFs to PFOA is concerned.

Despite what appears to be Kidde's clear understanding that C8-containing telomer-based AFFFs degrade to PFOA, when discussing its AFFFs with its customers, of which DoD was one, Defendant Kidde deceived users through a sleight of hand in its marketing materials. For example,

[redacted]

[redacted]."[302] Of course, the sleight of hand in this correspondence being the lack of transparency with respect to Kidde's actual knowledge that the C8-constiuents in its AFFFs degrade to PFOA. This discrepancy between what internal emails reveal with respect to industry knowledge, and the

[300] *See* Kidde_Defendants_00067848, attached to London Decl. as Ex. 237, at Kidde_Defendants_00067848.

[301] *See* § V.B.1 *supra*.

[302] *See* Regina Dep. Ex. DL480, Ex. 150.

misrepresentations being made to customers, which included DoD, is precisely the type of information that the government did not know and should have been warned of. However, not only was the government not warned of the PFOA degradation concerns related to telomer-based AFFFs, but, in fact, the government was misled so that Defendant Kidde could protect its bottom line by creating a façade of safety by distancing its AFFFs from PFOA. Such intentional conduct is not only wanton and reckless but undeserving of the protections of governmental immunity.

Defendant National Foam makes no independent arguments separate and apart from those of Kidde concerning its relative knowledge vis-a-vis the government, other than to state that even assuming that National Foam possessed all the information that was known to Kidde when it acquired the Kidde assets in 2013, at that point in time, all information was already known to government. This argument is not valid for several reasons.

First, even assuming *arguendo* that the government knew everything known to National Foam in 2013, National Foam was still under a duty to share internal information it had concerning hazards associated with C8-contanining AFFFs.[303]

Second, as has been clearly established above, the government's knowledge on this point was far inferior to that of Defendant Kidde. As such, since Defendant Kidde failed to demonstrate that it was fully transparent with the government concerning the dangers posed by its C8-containing telomer-based AFFFs, including their potential to degrade to PFOA, the defense should likewise be unavailable to Defendant National Foam who asserts no separate basis for the immunity beyond those espoused by Defendant Kidde.

[303] *See Jowers v. Lincoln Elec. Co*., 617 F.3d 346, 354–55 (5th Cir. 2010) (holding that a manufacturer must share its internal knowledge even where the government possesses equal information.).

Third, with respect to Defendant Kidde, as a former member of the FFFC, the knowledge of the FFFC, as set forth in their documents and statements can be imputed to it, as discussed in § V.B.7, *infra*. Similarly, National Foam, as a current member of the FFFC, the knowledge of the FFFC can similarly be imputed to National Foam. As such, the FFFC's misleading claims that telomer-based AFFFs neither contain nor degrade to PFOA are misrepresentations, which both Defendants Kidde and National Foam can be held responsible, and which had the effect of inducing the government into believing that any potential toxicity problems associated with PFOA were irrelevant to the use of telomer-based AFFF foams. This deception clouded the government's discretion regarding the use of C8-containing AFFFs. As such, governmental immunity should not cloak these Defendants who purposely distorted the government's knowledge to suit their illegitimate purposes.

4. At All Relevant Times Chemguard Never Warned the Government of the Dangers of C8-Containing AFFFs Degrading to PFOA that were known to it but not the Government.

Like its Co-Defendants, Defendant Chemguard misrepresented to its customers, including the DoD, that its products did not contain PFOA, thereby intentionally misleading them into thinking that their AFFFs have no association with PFOA. By way of example, [redacted] ."[304] [redacted] despite industry knowledge by no later than 2001, that C8-containing telomer-based AFFFs could degrade to PFOA.[305] [redacted]

[304] *See* Pl. Ex. 111, Novac Dep. Ex. DL1134, at AFFFTC00418728.

[305] *See* Regina Dep. Ex. DL461, Ex. 147.

[redacted]

[redacted]"[306] Again, these misrepresentations were made despite the fact that Chemguard listed its first AFFF on the QPL in 1998,[307] three years before Dynax's Dr. Chang indicated that common industry knowledge is that the final degradation product of C8-containing telomer-based AFFFs is PFOA.

Chemguard argues that its 2007 statement that [redacted] reflects Chemguard's "actual knowledge" concerning the degradation pathways of its fluorosurfactants.[308] However, this contention is contradicted by evidence that this was industry knowledge in 2001, and even by Chemgaurd's own 2001 disclosure.[309] At a minimum, this statement creates a material issue of fact as to whether this was Chemguard's actual knowledge as of 2007, or, rather, as Plaintiffs contend, that this statement is illustrative of the campaign of deception waged by the AFFF telomer industry beginning in 2001 intended to dissociate it from PFOA in order to avoid further federal scrutiny and potential industry regulation. Finally, like both Defendants National Foam and Kidde, and as discussed in § V.B.7, *infra*, as a member of the FFFC, the FFFC's knowledge, as evidenced in its statements and claims above, are imputed to Defendant Chemguard.

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[306] *See* Novac Dep. Ex. DL1126, Ex. 155, at AFFFTC00196371.

[307] *See* Telomer Defs.' Mem., at 20 (stating that, "Chemguard's first MilSpec AFFF had been on the QPL for just two years when 3M announced its exit from the AFFF market in 2000").

[308] *See* Telomer Defs.' Mem. at 20-21.

[309] *See* Vieweger Dep. Ex. DL1831, attached to London Decl. as Ex. 238, at 2 (Chemguard technical bulletin stating that, "[f]luorinated surfactants decompose in the environment to a certain extent, however, these molecules will always leave behind a fluorinated carbon chain. The fluorinated surfactants used in all Chemguard, Inc. AFFF formulations are telomer based, not based on Simon-cell chemistry (i.e. PFOS), and are therefore expected to be safer by 10-100 times.").

5. At All Relevant Times Buckeye Never Warned the Government of the Dangers of C8-Containing AFFFs Degrading to PFOA that were Known to it but Not the Government.

It is undisputed that Buckeye first listed an AFFF on the QPL in 2004.[310] Initially, it is important to point out that this is three years after the record establishes that it was common industry knowledge that C8-containing AFFFs degraded to PFOA. Notwithstanding this imputed knowledge, [redacted],"[311] once again, leaving out a critical and material piece of safety information, namely, knowledge that its products degrade to PFOA.

Exemplifying Buckeye's actual knowledge that its products would degrade to PFOA is a 2008 Buckeye internal email from Jim Devonshire, Buckeye Manger of Foam Business Development Group, stating:

> In the case of the AFFFs, a mixture of surfactants is used, one of which contains a perfluoro-octyl group. This surfactant is also made starting with C8F17I by reaction first with ethylene to form C8F17C2H4I that is then converted to C8F17C2H4SH in a multistep process. The C8F17C2H4SH is then reacted with 15 moles of acrylamide to form an oligomer. That oligomer is the surfactant.
>
> There is no PFOA in any of our products but it is theoretically possible for the acrylamide oligomer described above ***to biodegrade to PFOA***.[312]

Notwithstanding this irrefutable knowledge on the part of Buckeye that its AFFFs could degrade to PFOA, it was nonetheless telling its customers, which includes DoD, that its AFFFs did not contain PFOA, to create the impression that its AFFFs do not have a PFOA problem. Once again, these misrepresentations by omission deprived the government of significant and material

[310] *See* Telomer Defs.' Mem. at 23.

[311] *See* Devonshire Dep. Ex. 3, attached to London Decl. as Ex. 239, at BF00203759.

[312] *See* Vegso Dep. Ex. DL1734, attached to London Decl. as Ex. 240 (emphasis added).

information concerning the safety of Buckeye AFFFs, of which Buckeye was aware, which fails *Boyle's* prong three.

[redacted].”[313] [redacted].[314] [redacted].[315] As such, not only did Buckeye enter the MilSpec AFFF business after it was common industry knowledge that C8-containing telomer-based AFFFs contained constituents that degraded to PFOA, it repeatedly obfuscated this fact in its communications to customers, which includes DoD, through misleading product materials disassociating its products from PFOA, which rendered the government's knowledge far inferior to that of Buckeye concerning the potential dangers associated with use of its telomer-based AFFF.

Finally, like its co-Defendants, Buckeye, as a principal of the FFFC, has the knowledge of the FFFC imputed to it, as discussed in § V.B.7, *infra*, which includes both its public misrepresentations concerning telomer-based AFFFs as well as its possession of industry knowledge generally.

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[313] *See* Devonshire Dep. Ex. 9, attached to London Decl. as Ex. 241.

[314] *See* Pl. Ex. 113, Dep. Tr. of James Devonshire, at 143:1-14.

[315] *See id.* at 143:1-14, 144:7-11; *see also id.* at 156:19-157:4 [redacted].

6. At All Relevant Times Ansul and Tyco Never Warned the Government of the Dangers of C8-Containing AFFFs Degrading to PFOA that were Known to them but not the Government.

Tyco Fire Products LP (formerly The Ansul Company)("Tyco/Ansul") first qualified a telomer-based AFFF onto the QPL as early as 1976.[316] In fact, in the early 1960's, Ansul, along with 3M, was involved in the development of the first AFFF LightWater formulations for the NRL.[317] Specifically, in 1964, Ansul reached an agreement with 3M to test its LightWater formulations at Ansul's facilities in exchange for being 3M's exclusive distributor of LightWater for sales outside of the federal government.[318]

As it was fully immersed in the AFFF industry since the beginning, Tyco/Ansul had perhaps the most knowledge of the moving Telomer Defendants pertaining to the fluorosurfactant components of their AFFF. For example, in 1982, when the Navy inquired about the animal teratogenicity of Ansul's AFFF, Ansul reassured them that, "there is not any absorption or inhalation of the fluorochemicals used in ANSULITE AFFF products into the human body. Since the material is not accumulated in the body the question of whether or not it is a teratogen is really moot."[319]

Regarding the degradation of AFFF C8 fluorosurfactants to PFOA in the environment, Tyco/Ansul had knowledge of such potential at least as early as 1998. [redacted]

[316] *See* Engman Dep. Ex. DL342, Ex. 205, at 8; *see also* Walker Dep. Ex. BB797, attached to London Decl. as Ex. 242, at DYNAX0001202 ([redacted]).

[317] *See* Pl. Ex. 32, Falco Dep. Ex. DL124 ("History of the Development of 'Light Water' Brand [AFFF]"), at 3M_AFFF_MDL01298000.

[318] *See id*. at 3M_AFFF_MDL01298001-02.

[319] *See* Bowling Dep. Ex. BB853, attached to London Decl. as Ex. 243, at AFFFTC00097498.

[redacted],[320] [redacted] [redacted].”[321] As such, there can be no question that by the time it became industry knowledge that C8-contaning telomer-based AFFFs could degrade to PFOA in 2001, Tyco/Ansul was deeply entrenched in the telomer-based AFFF business, [redacted].

Tyco/Ansul was also a founding member of the FFFC from 2001-2017,[322] and, like Defendants Kidde, National Foam, Buckeye, and Chemguard, any knowledge of the FFFC can likewise be imputed to it,[323] as discussed in § V.B.7, *infra*, which includes, of course, knowledge concerning the degradation of telomer-based AFFFs to PFOA.[324] Notwithstanding such

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[320] *See* Engman Dep. Ex. DL342, Ex. 205, at 11 ([redacted]).

[321] *See* AFFFTC00094736, attached to London Decl. as Ex. 244. [redacted] *See* Hubert Dep. Ex. LP760, attached to London Decl. as Ex. 245, at AFFF-MDL-EID-00251273.

[322] *See* Hubert Dep. Ex. LP758, Ex. 145, at AFFF-MDL-CHE-00004465 ([redacted]; AFFF-MDL-EID-03748356, attached to London Decl. as Ex. 246, at AFFF-MDL-EID-03748363 ([redacted]); FFFC001212, attached to London Decl. as Ex. 247, at FFFC001213 (Tyco present at FFFC Board of Directors meeting on Apr. 27, 2017); *see also* FFFC website (displaying logos of FFFC members), available at: fffc.org (last visited June 17, 2022). Further, since 2017 through today, Johnson Controls, with whom Tyco merged in 2016, maintains membership in the FFFC. *See* AMEREX_00407821, attached to London Decl. as Ex. 248, at AMEREX_00407824 (Johnson Controls present at FFFC Board of Directors meeting on Dec. 1, 2017); DYNAX0025104, Ex. 233, at DYNAX0025106 ([redacted]).

[323] It should be noted that Tyco/Ansul [redacted] *See* Cox Dep. Ex. TC248, attached to London Decl. as Ex. 249; *see also* Pl. Ex. 73, Dep. Tr. of Gregg Ublacker (Vol. II), dated Mar. 4, 2021, at 632:4-11 [redacted]

[324] *See, e.g.*, Dep. Tr. of Mitchell J. Hubert, Ex. 204, at 107:22-108:8 ([redacted]).

knowledge, like its co-Defendants, Tyco/Ansul nonetheless represented that [redacted]

[redacted]."[325]

7. The Manufacturing Members of the FFFC are Justifiably Imputed with the Knowledge of their Agent, the FFFC.

The FFFC is a "non-profit trade association formed in 2001 to focus on issues related to the efficacy and environmental impact of fire fighting foams."[326] The stated purposes of the FFFC are the "development of industry positions, and interactions with relevant organizations such as environmental agencies, militaries, approval agencies, and standards bodies,"[327] and representing the firefighting foam industry [redacted]"[328] FFFC "[m]embers are AFFF manufacturers, fluorosurfactants manufacturers, and distributors,"[329] and include all moving Defendants except for 3M. [redacted]

[redacted].[330] Throughout its existence and in furtherance of its stated mission,

[325] *See* Ublacker Dep. Ex. DL1083, attached to London Decl. as Ex. 250, at AFFFTC00212429. *See also* Cox Dep. Ex. TC248, Ex. 249, [redacted] Dep. Tr. of Gregg Ublacker (Vol. I), dated Mar. 3, 2021, attached to London Decl. as Ex. 251, at 171:11-19 ([redacted]). [redacted]. *See id.* at 155:8-17.

[326] *See* FFFC website, available at: fffc.org (last visited June 17, 2022). As Justice Stevens aptly stated in his dissent in *Bell Atlantic Corp. v. Twombly,* 55 U.S. 544, 591 (2007), "[m]any years ago a truly great economist perceptively observed that '[p]eople of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or in some contrivance to [make money].'" (quoting Adam Smith, *An Inquiry Into the Nature and Causes of the Wealth of Nations,* in 39 Great Books of the Western World 55 (R. Hutchins & M. Adler eds. 1952)).

[327] *See* FFFC website, available at: fffc.org (last visited June 17, 2022).

[328] *See* DYNAX0003550, attached to London Decl. as Ex. 252, at DYNAX0003552.

[329] *See* FFFC website, available at: fffc.org (last visited June 17, 2022).

[330] *See* DYNAX0003550, Ex. 252, at DYNAX0003555 ([redacted]); *Id.* at DYNAX0003553 ([redacted]).

FFFC has made numerous statements to the U.S. government about AFFF that are relevant to issues in this litigation, and which are imputed to its members.

The knowledge of FFFC is imputed to each of its members under common agency principles. An "agent" is authorized to act on behalf of a "principal." Restatement (Second) Agency §§ 1, 3. It is beyond dispute that the Coalition is authorized to act on behalf of all Defendants. It is a coalition of AFFF manufacturers organized to represent the foam industry's interests.[331] [redacted]"[332] The association pledges on its members' behalf to be their "environmental voice" and provide "accurate, balanced information on environmental and performance related questions" and ensure that environmental and regulatory authorities have "accurate information" about fire-fighting foams.[333] Thus, the FFFC is the agent authorized to act on behalf of the principals --- the AFFF manufacturers, fluorosurfactant manufacturers, and distributors

Black letter law "charges a principal with his agent's knowledge."[334] This rule is based upon the principle that it is the 'agent's duty to communicate to his principal the knowledge which

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[331] *See* FFFC website, available at: fffc.org (last visited June 17, 2022).

[332] *See* AFFF-MDL-EID-01001353, attached to London Decl. as Ex. 253, at AFFF-MDL-EID-01001355.

[333] *See* FFFC website, available at: fffc.org (last visited June 17, 2022).

[334] *Martin Marietta Corp. v. Gould, Inc.*, 70 F.3d 768, 771 (4th Cir. 1995) (citation omitted); *see also Liberty Univ., Inc. v. Citizens Ins. Co. of Am.*, 792 F.3d 520, 529 (4th Cir. 2015) ("The general rule is that knowledge of the agent is imputed to the principal.") (citations omitted); *Am. Sur. Co. v. Pauly*, 170 U.S. 133, 153 (1898) ("It is the rule that the knowledge of the agent is the knowledge of his principal"); *Veal v. Geraci*, 23 F.3d 722, 725 (2d Cir. 1994) ("In general, when an agent is employed to represent a principal with respect to a given matter and acquires knowledge material to that representation, for purposes of assessing the principal's rights and liabilities vis-à-vis a third-person the agent's knowledge is imputed to the principal."); *see also City of N.Y. v. Lead Indus. Ass'n*, 597 N.Y.S.2d 698, 700 (N.Y. App. Div. 1993) (when manufacturers accomplished their plan by having it "propounded by their trade

he has respecting the subject matter' of the relationship."[335] The only limitation to this imputation principle is where the agent acts in a manner unauthorized by the principal or where the agent acts "solely for its own purposes or those of another person."[336] However, where the principal and agent are one and the same, as in this case, "the acts and knowledge of the agent will nonetheless be imputed to the principal . . . even if the agent is acting adverse to the principal.").[337] Furthermore, "where the agent acquires information in furtherance of the agent-principal relationship, that knowledge is deemed known by the principal."[338] "Under the general rule, the knowledge imputed to the principal is considered actual knowledge, not constructive."[339]

Although, there are many cases holding that "mere membership in a trade association, including attendance at meetings, is not sufficient to give rise to an inference of conspiracy [aka knowledge], absent proof of knowing participation in the wrongful conduct,"[340] these cases are inapposite because typically they involve conspiracy and or allegations of *unlawful conduct* by the trade association which is not at issue in this litigation.[341] Here, Plaintiffs are simply imputing

association . . . [e]ach of the manufacturers thus became a principal, chargeable with the knowledge and conduct of its agent.") (citation omitted); *see also* Restatement (Third) of Agency § 5.03 (2006) ("For purposes of determining a principal's legal relations with a third party, notice of a fact that an agent knows or has reason to know is imputed to the principal if knowledge of the fact is material to the agent's duties to the principal."); Restatement (Second) of Agency § 9 (1958).

[335] *Doe v. NSA*, 1998 U.S. App. LEXIS 27053, at *6 (4th Cir. 1998) (citation omitted).

[336] *Richardson v. All. Residential Co.*, 2020 U.S. Dist. LEXIS 75285, at *22-23 (D. Md. 2020).

[337] *In re Derivium Capital LLC)*, 716 F.3d 355, 368 (4th Cir. 2013).

[338] *Richardson*, 2020 U.S. Dist. LEXIS 75285, at *22-23 (citation omitted).

[339] *Martin Marietta Corp*, 70 F.3d at 773 n. 4 (citation omitted) (emphasis added).

[340] *In re Asbestos Litig.,* 509 A.2d 1116, 1120-21 (Del. Super. Ct. 1986) (citing *N.A.A.C.P. v. Claiborne Hardware Co.*, 458 U.S. 886, 920 (1982)).

[341] *See, e.g., Feldman v. North British Mercantile Ins. Co.*, 137 F.2d 266 (4th Cir. 1943) ("mere membership in the body or contribution of dues or money to effectuate the common purpose does not make all the members liable for ***unlawful*** acts of the association done without their participation and without their knowledge or approval") (emphasis added); *AD/SAT v. AP*, 181 F.3d 216, 234 (2d Cir. 1999) ("In situations where a trade association, its officers, employees or members are found to have violated the antitrust laws, membership in the association will not automatically involve all members in the violation [absent] evidence of actual knowledge of, and participation in, the ***illegal scheme*** in order to establish a violation of the antitrust laws by a particular association member.") (emphasis

knowledge reflected in the FFFC's statements to the government to its members and are not attempting to impose liability on Defendants based solely on actions by the FFFC who is not a party this MDL.

Although Plaintiffs are not required to prove that the Defendants had knowledge of the FFFC's actions to impute FFFC's knowledge to the Defendants, they nonetheless meet this standard because the FFFC members and Board members were and are comprised of the moving Defendants in this lawsuit (not including 3M). This is not a case where a defendant was merely participating in a trade association or where the trade association was acting independently of its members. The evidence shows that the FFFC's officers were comprised of representatives of its members [redacted].[342] Indeed, [redacted].[343] Thus, FFFC knowledge is imputed to its members.[344]

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added); *Moore v. Boating Indus. Ass'n*, 819 F.2d 693, 716 (7th Cir. 1987) ("There must . . . be some evidence of actual knowledge of, and participation in, an ***illegal scheme*** in order to establish a violation of the antitrust laws by a particular association member.") (citation omitted) (emphasis added); *Kline v. Coldwell, Banker & Co.*, 508 F.2d 226, 231-33 (9th Cir. 1974) (to be liable, trade association members must have "knowingly, intentionally and actively participated in an individual capacity in the scheme"); *Wilk v. American Med. Ass'n*, 671 F. Supp. 1465 (N.D. Ill. 1987) (defendants' mere membership in the AMA was not evidence that they were involved in a conspiracy with other members of the AMA); *James Julian Inc. v. Raytheon Co.*, 557 F. Supp. 1058, 1065 (D. Del. 1983) (membership in trade association, including attendance at meetings, will not give rise to inference of conspiracy).

[342] *See* Dep. Tr. of Mitchell J. Hubert, Ex. 204, at 192:1-15 ([redacted]); Dep. Tr. of Brian Rambo, dated Mar. 5, 2021, attached to London Decl. as Ex. 254, at 116:1-12 ([redacted]) and 250:3-6 ([redacted]).

[343] *See* DYNAX0003550, Ex. 252, at DYNAX0003554 ([redacted]); *Id.* at DYNAX0003553 ([redacted]).

[344] While FFFC members are deemed to have actual knowledge of information known to FFFC, all Defendants (whether FFFC members or not) are deemed to have constructive knowledge of the same information as a matter of law. A product manufacturer has long been held to the standard of an expert in its field and is charged with knowledge

8. The Telomer Defendants have failed to Meet their Burden of Proving the Third Prong of *Boyle*

Although each AFFF Telomer Defendant claims that its knowledge of dangers posed by C8-containing telomer-based AFFFs was never greater than the government's knowledge, the above discussion proves otherwise. Having controverted Defendants' factual contentions regarding what each defendant knew vis-à-vis the government, there remains myriad questions of fact for the jury.

Without an undisputed factual record, it is impossible to render any ruling as a matter of law. And Defendants' authorities offer no support to the contrary given the factual circumstances present in this litigation. The Telomer Defendants rely on three non-binding cases, namely, *Haltiwanger v. Unisys Corp*., 949 F. Supp. 898, 904 (D.D.C. 1996), *Stout v. Borg-Warner Corp*., 933 F.2d 331, 336-37 (5th Cir. 1991) and *In re Agent Orange Prod. Liab. Litig*., 304 F. Supp. 2d 404, 435 (E.D.N.Y. 2004), in support of their argument that prong three of *Boyle* is satisfied so long as the government possesses the same actual knowledge regarding an alleged defect as the government contractor.

The Telomer Defendants' reliance on these three cases is misplaced. First, in *Haltiwanger*, the United States Postal Service was aware of injuries posed by a letter sorter used by employees of the Postal Service, in part, because of its decades long experience with the letter sorters that

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of all the information about their products that is known or knowable in the community at large, including information known to industry and trade associations. *See, e.g., Mack v. Stryker Corp.*, 748 F.3d 845, 849–50 (8th Cir. 2014); *see George v. Celotex Corp*., 914 F.2d 26, 29 (2d Cir. 1990) (asbestos manufacturer charged with knowledge of information in unpublished report that manufacturer never received and never saw); *Borel v. Fibreboard Paper Prods. Corp*., 493 F.2d 1076, 1089–90 (5th Cir. 1973); *Brown v. Raymond Corp*., 318 F. Supp. 2d 591, 597–98 (W.D. Tenn. 2004) (A reasonable manufacturer "is presumed to be 'omniscient.'"); *Carolina Home Builders, Inc. v. Armstrong Furnace Co*., 191 S.E.2d 774, 779 (S.C. 1972).

resulted in injury from an open and obvious defect in the product. Additionally, the government was aware of the defect as a result of the government's participation in the design of the letter sorter. Here, as discussed in Plaintiffs' Original Opp., the government did not participate in the design of Mil-Spec AFFF, rather, the government's involvement was limited to identifying performance parameters.[345] Further, as discussed above, open and obvious mechanical defects are not equivalent to chemical toxicity assessments involving latent human harm resulting from toxic exposures. As such, *Haltiwanger* provides no support for the telomer Defendants' position.

Stout is equally inapposite. In *Stout,* the court held that the government contractor defense applied finding that the government had knowledge of the dangers posed by the air conditioning unit at issue in that case. The court specifically noted that there was an express warning in the technical manual that warned against the precise injury the plaintiff claimed.[346] Moreover, the court noted the danger posed by the fan was open and obvious to anyone even had the express warning not been provided.[347] Clearly, that is not the case here. In fact, it is undisputed that the telomer-based AFFF manufacturers provided no warning on their AFFFs that the products would degrade to PFOA in the environment, and, in fact, articulated the opposite to AFFF users, that is, that the telomer-based AFFFs did not contain PFOA. Moreover, there is nothing open and obvious either about the fact that telomer-based AFFFs degrade to PFOA and/or that PFOA is harmful to humans and the environment, in fact, if such were the case, then the telomer AFFF manufacturers would be hard pressed to claim that they were unaware of the dangers posed by their products.

Lastly, in *In re Agent Orange Prod. Liab. Litig.,* 304 F. Supp. 2d 404 (E.D.N.Y 2004), again, the government at all times had actual knowledge of the defect at issue with *Agent Orange,*

[345] *See* Pls.' Original Opp. at 24-25.

[346] *Stout*, 933 F.2d at 336.

[347] *Id.*

i.e., the presence of Dioxin, a known toxic agent to humans. In that case, the government's specifications were very precise, specifically calling for a recipe for Agent Orange, to include equal parts of 2,4, 5-T and 2,4-D,[348] all the while knowing that dioxin would be present in the herbicide. On this score, Agent Orange courts found as a fact: "No one can reasonably dispute the fact that the government possessed information about the potential dangers of Agent Orange that was as great as, if not greater than, that possessed by the defendants."[349] Such is not the case here, where, the clear testimony from witnesses from the United States is that they were entirely unaware at all relevant times that telomer-based AFFFs had the potential to degrade to PFOA, and, further were told by industry that no such defect existed. As such, the facts are entirely contrary to those in *In re Agent Orange*, and thus it provides no support for the telomer Defendants' position.

As discussed above, at all relevant times, the government was entirely unaware that telomer MilSpec AFFFs contained and/or degraded to PFOA, and further, were told the opposite by the telomer MilSpec AFFF manufacturers. As such, to the extent that the government was on notice of any toxicity concerns related to PFOA following 3M's phaseout of C8-chemistires in 2000, and/or as a result of the EPA's subsequent opening of administrative docket for PFOA (AR-226), the EPA would not have associated such potential harms with telomer-based AFFF given nearly 15-year campaign of deception by the telomer-based AFFF manufacturers to distance themselves from problems associated with PFOA. With the government being purposely misinformed by its suppliers of the dangers of AFFF, there is no sound policy reason to find that *Boyle* prong three has been satisfied or that immunity is warranted.

[348] These facts are diametrically opposite to the AFFF MilSpec which gave carte blanche discretion to the manufactures to choose a fluorocarbon surfactant and for which the government had no idea what the formulation was for any manufacturer's trade secret products.

[349] *Miller*, 275 F.3d 414 at 421.

VI. CONCLUSION

As detailed above and summarized in the attached Index of Material Facts in Dispute,[350] multiple genuine issues of material fact remain for the jury to decide, thus precluding summary judgment. Plaintiffs respectfully request that the Court deny Defendants' Motion for Partial Summary Judgment on the Second and Third Prongs of the Government Contractor Immunity Defense and grant such other relief as the Court deems just and proper.

Dated: June 17, 2022

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[350] *See* Appendix.

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was electronically filed with this Court's CM/ECF on this 17th day June 2022 and was thus served electronically upon counsel of record.

/s/ Fred Thompson, III

APPENDIX A

INDEX OF MATERIAL FACTS IN DISPUTE
PURSUANT TO LOCAL RULE 7.05(A)(4)

Plaintiffs object to every statement set forth in the "Common Undisputed Facts" section of Defendants' Omnibus Motion for Partial Summary Judgment on the Second and Third Elements of the Government Contractor Immunity Defense, including those referenced and/or incorporated therein. Dkt. 2346-1, pp. 8-10.

The following is a non-exhaustive list of issues of fact in dispute, the details of which are set forth throughout Plaintiffs' Brief in Opposition and Plaintiffs' Original Opp., which is incorporated by reference herein:

- Is the AFFF MilSpec reasonably precise?
- Did the AFFF MilSpec require the use of PFOS or PFOA?
- Was the AFFF formula left to the discretion of the AFFF manufacturers?
- Did the AFFF manufacturers' AFFF comply with the Mil-Spec at all times?
- Do the defendants possess superior knowledge of the defects associated with AFFF?
- Did 3M learn in 1975 that PFOS was present in the blood of the general population?
- When did the government first learn that PFOS was present in the blood of the general population?
- When did the government first learn PFOS was present in the blood of the general population and that AFFF was a potential source of the PFOS?
- When did the defendants have actual knowledge of the potential toxicity of PFOA or PFOS?
- When did the government have actual knowledge of the potential toxicity of PFOA or PFOS?
- When did the government actually know that PFOA or PFOS is present in AFFF?
- Does the US Government have actual knowledge of the defects associated with AFFF?
    - If so, when did it obtain that knowledge?
- Did the government continue to use AFFF actually knowing that doing so would result in harm to people?

- Did the government continue to use AFFF actually knowing that doing so would contaminate water supplies?

- Does C8-based AFFF degrade to PFOA?
    - If yes, when was this actually known to defendants and the government?
- Did the telomer defendants intentionally mislead the government by claiming that their AFFF did not degrade to PFOA?

- Did the telomer defendant statements that their AFFF did not contain PFOA or PFOS mislead the government and impact its decisions regarding using AFFF?

- Were the defendants truthful and forthright in communications to plaintiffs, the public, regulators and the scientific community?

- Does PFOA or PFOS cause human harm?
- Did the defendants withhold "substantial risk information" pertaining to PFOA and/or PFOS from the government?

- Did the timing of the defendants' disclosures delay regulatory action by the government?
    - And if so, for how long?